Nikon

En

# Nikon Capture 4

Ver. 4.1

*User's Manual*

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## Package Contents

Before using this product, check that the package contains the items listed below. Contact your retailer or local Nikon representative should you find that any of these items are missing or damaged.

- Nikon Capture 4 installer CD
- *Nikon Capture 4 Install Guide*
- *Nikon Capture 4 User's Manual* (this manual)
- User registration card (USA only)

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### Make Backup Copies

Make backup copies of important pictures before processing. Nikon will not be held liable for damages or lost profits that may result from product malfunction.

| **WARNING!** |
| --- |
| *Do not play the Nikon Capture 4 installer CD on audio CD equipment. Playing a CD-ROM on an audio CD player could cause hearing loss or damage the equipment.* |

# Table of Contents

**Introduction : Before You Begin ..... 1**
Overview : About This Manual ..... 2
Principal Features : Features Available in Nikon Capture 4 ..... 3
System Requirements : What You Need to Run Nikon Capture 4 ..... 4
Installation ..... 5
**Nikon Capture 4 Editor : Image Adjustment ..... 7**
The Editor Window : Getting to Know Nikon Capture 4 Editor ..... 8
Starting Nikon Capture 4 Editor ..... 10
Exiting Nikon Capture 4 Editor ..... 12
Opening Image Files ..... 13
Zoom ..... 18
The Bird's Eye Palette ..... 19
Rotating and Flipping Images ..... 20
The Information Palette ..... 21
Selecting a Crop ..... 24
Image Adjustment : Enhancing Images ..... 25
White Balance ..... 29
Advanced RAW ..... 35
Image Dust Off ..... 38
Vignette Control ..... 42
Curves ..... 44
The LCH Editor ..... 54
Color Booster ..... 59
Color Balance ..... 61
Unsharp Mask ..... 64
Noise Reduction ..... 67
Digital DEE ..... 69
Fisheye Lens (Fisheye-to-Rectilinear Transform for DX 10.5 mm Fisheye Lenses) ..... 73
Output Size and Resolution ..... 75
Saving and Loading Image Adjustment Settings ..... 78
Saving Images ..... 79
Printing Images ..... 84
Batch Processing ..... 88
Nikon Capture 4 Editor Preferences : Fine-Tuning Nikon Capture 4 Editor ..... 93
The General Tab ..... 94
The Temporary Files Tab ..... 96
The Advanced Color Tab ..... 96
The Grid Lines Tab ..... 97
The Color Management Tab (Windows) ..... 98
The Color Management Tab (Macintosh) ..... 99
**Nikon Capture 4 Camera Control : Capturing Photographs ..... 101**
The Camera Control Window : Getting to Know Nikon Capture 4 Camera Control ..... 102
Starting Nikon Capture 4 Camera Control ..... 104
Exiting Nikon Capture 4 Camera Control ..... 107
Capturing Photographs to Disk ..... 108
Processing Photographs as They Are Captured ..... 112
Time Lapse Photography ..... 116
The Nikon Capture 4 Camera Control Window ..... 119
Custom Settings ..... 132
Nikon Capture 4 Camera Control Preferences : Fine-Tuning Nikon Capture 4 Camera Control ..... 135
The General Tab ..... 136
The Temporary Files Tab ..... 137
The Color Management Tab ..... 137

**Appendices : Technical Notes** ..... **139**
Appendix A : Supported Color Profiles ..... 140
1. Standard RGB Profiles Supported in Nikon Capture 4 ..... 140
2. Technical Data for RGB Profiles Supported in Nikon Capture 4 ..... 142
Appendix B : Color Matching in Adobe Photoshop (Version 7.0 or Later) ..... 143
Step 1—Choosing a Monitor Profile ..... 143
Step 2—Adjusting Settings in Adobe Photoshop ..... 146
Appendix C : Troubleshooting ..... 148
Appendix D : Glossary ..... 150
Index ..... 156

# Introduction

*Before You Begin*

Read this chapter before installing and using Nikon Capture 4.

*Overview*
Read this section for a description of how this manual is organized and for an explanation of the symbols and conventions used.

*Principal Features*
Read this section for an overview of the options available in Nikon Capture 4.

*System Requirements*
Before installing Nikon Capture 4, check that your computer system meets the requirements listed in this section.

# Overview

*About This Manual*

This manual has been written to help you take advantage of the many features included in Nikon Capture 4. Be sure to read this manual thoroughly, and to keep it handy when using Nikon Capture 4.

**Symbols and Conventions**

The following symbols and conventions are used in this manual:

| | | | |
|---|---|---|---|
| | This icon marks cautions, information that you should read before use to prevent possible damage to your camera or computer. | | This icon marks notes, information that you should read before using this software. |
| | This icon marks tips, additional information you may find helpful when using this software. | | This icon indicates that more information is available elsewhere in this manual. |
| Menu items and button names are shown in **bold**. | | | |

**Background Knowledge**

This manual assumes knowledge of operations common to Windows and Macintosh environments. Refer to the documentation provided with your computer for more information on operations specific to your operating system.

**Illustrations**

This manual is for use with both Windows and Macintosh versions of Nikon Capture 4. While the majority of the illustrations in this manual show the Windows versions, save where otherwise noted the operations described apply to both operating systems. Depending on the operating system used, dialogs and menus may differ slightly from those shown here.

**The ReadMe File**

Be sure to read the ReadMe file on the Nikon Capture 4 installer CD, as it may contain important information that could not be included in this manual.

**Life-Long Learning**

As part of Nikon's "Life-Long Learning" commitment to ongoing product support and education, continually-updated information is available on-line at the following sites:

- For users in the U.S.A.: *http://www.nikonusa.com/*
- For users in Europe: *http://www.europe-nikon.com/support*
- For users in Asia, Oceania, the Middle East, and Africa: *http://www.nikon-asia.com/*

Visit these sites to keep up-to-date with the latest product information, tips, answers to frequently-asked questions (FAQs), and general advice on digital imaging and photography. Additional information may be available from the Nikon representative in your area. See the URL below for contact information:

*http://nikonimaging.com/*

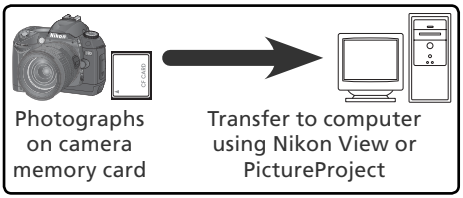
# Principal Features

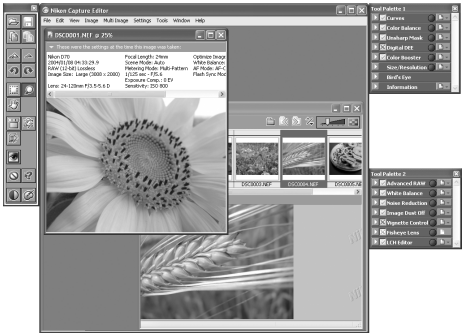
*Features Available in Nikon Capture 4*

Nikon Capture 4 is for use exclusively with Nikon digital cameras. It consists of two major components: Nikon Capture 4 Editor and Nikon Capture 4 Camera Control.

## Nikon Capture 4 Editor

Nikon Capture 4 Editor is used to enhance photographs taken with Nikon digital cameras after they have been transferred to the computer using Nikon View or PictureProject. Nikon Capture 4 Editor supports batch processing and can be used to adjust RAW images in ways not supported by other software.

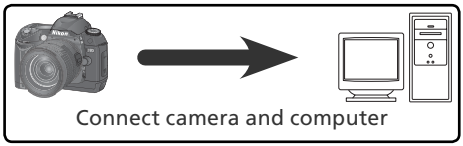


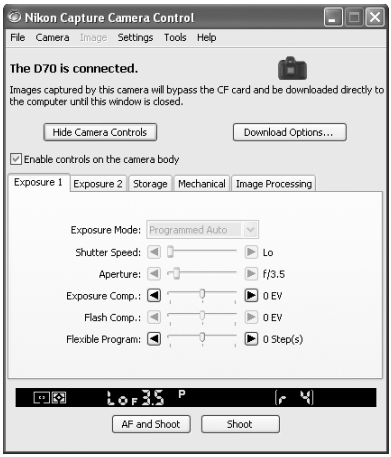



Nikon Capture 4 Editor

## Nikon Capture 4 Camera Control

When a D2H, D1-series, D100, or D70 camera is connected to a computer running Nikon Capture 4 Camera Control, photographs can be recorded directly to the computer hard disk as they are taken. The controls in the Nikon Capture 4 Camera Control window can be used to release the shutter or adjust camera settings, or to perform interval timer photography not otherwise supported on some models.




Nikon Capture 4 Camera Control

# System Requirements

*What You Need to Run Nikon Capture 4*

Before installing Nikon Capture 4, make sure that your system satisfies the following requirements:

| | | Windows | Macintosh |
|---|---|---|---|
| **OS** | | Pre-installed versions of Windows XP Home Edition, Windows XP Professional, Windows 2000 Professional, Windows Millennium Edition (Me), Windows 98 Second Edition (SE) | Mac OS 9.0.4*, 9.1*, 9.2*, Mac OS X (version 10.1.5 or later) |
| **CPU/Model** | | 300 MHz Pentium or better | iMac, iMac DV, Power Mac G3 (Blue & White), Power Mac G4 or later, iBook, PowerBook G3 or later |
| **RAM** | | • Windows, Mac OS X: 256 MB (768 MB or more recommended)<br>• Mac OS 9: memory allocation of 64 MB or more to Nikon Capture 4 Camera Control, 512 MB or more to Nikon Capture 4 Editor | |
| **Hard-disk space** | | 200 MB required for installation | |
| **Video resolution** | | 800×600 pixels or more with 16-bit color (High Color/thousands of colors). 24-bit color (True Color/millions of colors) recommended. | |
| **Interface** | **IEEE 1394**† | **O**pen **H**ost-**C**ontroller **I**nterface (OHCI) compliant IEEE 1394 interface board or card‡ required for connection to D1, D1x, and D1H | Built-in IEEE 1394 (FireWire) interface required for connection to D1, D1x, and D1H |
| | **USB**** | Built-in USB interface | • Built-in USB interface<br>• RATOC REX-PCIU3U USB interface board (USB 2.0; for use only with D2H under Mac OS X)‡ |
| **Supported cameras (Camera Control)** | | D1, D1x, D1H, D2H, D100††, and D70 | |
| **Other** | | CD-ROM drive required for installation | |

* With CarbonLib version 1.6 or later.

† The camera may not function as expected when connected to an IEEE 1394 hub.

‡ A list of boards and cards that have been tested and approved for use with the D1, D1x, and D1H is available on-line (2).

** The camera may not function as expected when connected to a USB hub or keyboard.

†† Camera firmware version 2.00 or later.

## Installation

For information on installing Nikon Capture 4, see the *Nikon Capture 4 Install Guide*.

### Camera Control for D100 Cameras (Macintosh)

Before using Nikon Capture 4 Camera Control with a D100 digital camera under Mac OS 9 or Mac OS X, confirm that the camera firmware is version 2.00 or later. Users of earlier versions will need to upgrade the camera firmware before using Nikon Capture 4 Camera Control. Contact a Nikon-authorized service representative for information on firmware upgrades.

### Windows XP Home Edition/Professional, Windows 2000 Professional, Mac OS X

Installing and using Nikon Capture 4 under a multi-user operating system requires Administrator privileges. When using Nikon Capture 4, log in as:

| | |
|---|---|
| **Windows XP Home Edition/Professional** | Computer administrator |
| **Windows 2000 Professional** | Administrators |
| **Mac OS X** | Admin |

### Mac OS 9.0

If you are using Mac OS 9.0, use the Software Update control panel to update to the latest version of CarbonLib before beginning installation.

### Third-Party Plug-Ins

Nikon Capture 4 supports third-party nik Color Efex Pro 2.0 for Nikon Capture 4 plug-ins that add a filter palette to Tool Palette 2. More information is available on-line (2).

# Nikon Capture 4 Editor

*Image Adjustment*

Nikon Capture 4 editor component contains a variety of tools for enhancing images, including the Curves, LCH Editor, Color Booster, Color Balance, Unsharp Mask, Noise Reduction, Digital DEE and Fisheye Lens tools. With RAW (NEF) images, it can be used to adjust white balance and tone compensation, to reduce the effects of dust on the camera image sensor, including color moiré (Image Dust Off), and to correct for the slight darkening at the margins of an image (vignetting) particular to the field of view of a given lens. When RAW images are saved in NEF format, image enhancement settings are saved separately from the original image data, allowing you to modify settings repeatedly without degrading the quality of the original image. Nikon Capture 4 Editor is also equipped with a batch option for automated processing of multiple images.

This chapter details the operations that can be performed using Nikon Capture 4 Editor. It is divided into the following sections:

*The Editor Window*
Read this section for an overview of the controls in the Nikon Capture 4 Editor window.

*Image Adjustment*
Read this section for instructions on enhancing images using Nikon Capture 4 Editor.

*Nikon Capture 4 Editor Preferences*
Read this section for information on fine-tuning settings in the Nikon Capture 4 Editor window.

# The Editor Window

*Getting to Know Nikon Capture 4 Editor*

The main parts of the Nikon Capture 4 Editor window are identified below.

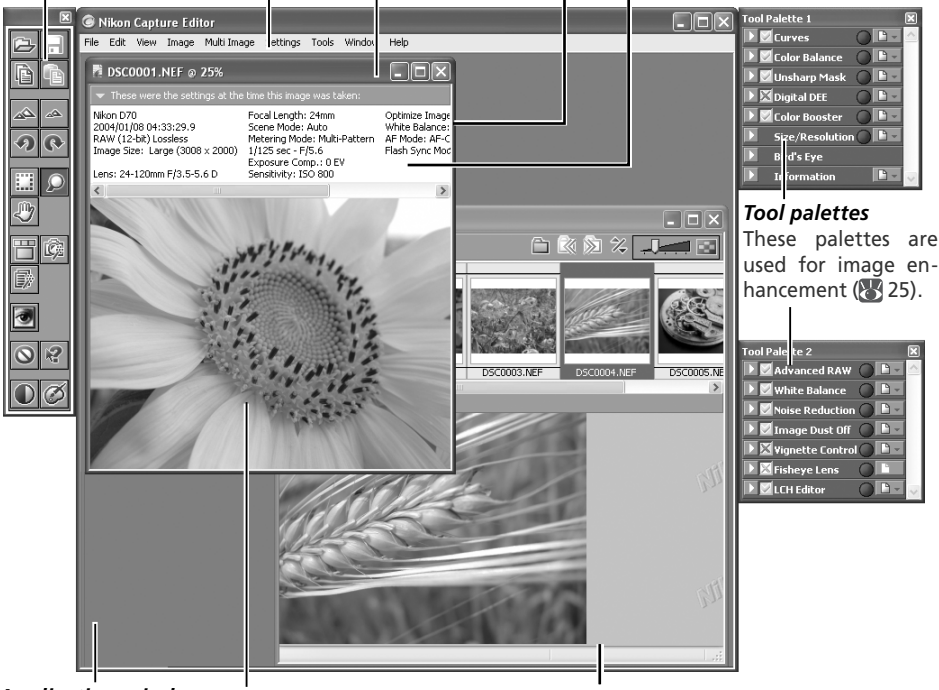
***Menu bar***
Contains the menus for Nikon Capture 4 Editor.

***Image window***
Displays images currently opened for editing. Any number of image windows can be open simultaneously.

***Quick Tools palette***
Contains tool buttons for Nikon Capture 4 Editor (9).

***Title bar***
Shows the file name of the image displayed and the current zoom ratio.

***Shooting data area***
Gives photo information on the image displayed.




***Tool palettes***
These palettes are used for image enhancement (25).

***Application window***
(Windows only)

***Image area***
Shows the image currently being edited.

***Multi-Image window***
Lists the images in the current folder as thumbnail previews (15).

**The Menu Bar and Quick Tools**

Although many operations can be performed using both menu commands and the buttons in the Quick Tools palette, the explanations in this manual give priority to operations performed using tool buttons.

**Hiding the Tool Palettes and Quick Tools Palette**

Press tab to hide or display the tools and Quick Tools palettes.

## Quick Tools

The Quick Tools palette contains buttons that replicate commonly-used menu commands.

| Button | Name | Function | Shortcut* | |
|---|---|---|---|---|
| | **Open** | Click to open an image file for editing. | Ctrl + 0/ cmd + 0 | 13 |
| | **Save** | Save changes to the image in the active image window. | Ctrl + S/ cmd + S | 79 |
| | **Copy Image Adjustments** | Copy current image-adjustment settings to the clipboard. | — | 78 |
| | **Paste** | Paste the contents of the clipboard to image enhancement settings in the active window. | Ctrl + V/ cmd + V | — |
| | **Zoom In** | Zoom in on the image in the active window. | Ctrl + +/ cmd + + | — |
| | **Zoom Out** | Zoom out from the image in the active window. | Ctrl + –/ cmd + – | — |
| | **Rotate 90 CCW** | Rotate the image in active window ninety degrees counter-clockwise. | Ctrl+Shift+R/ shift+cmd+R | 20 |
| | **Rotate 90 CW** | Rotate the image in active window ninety degrees clockwise. | Ctrl + R/ cmd + R | 20 |
| | **Crop Cursor** | Use this tool to select the portion of the image in the active window that will be saved. | C/C | 24 |
| | **Zoom Cursor** | Use to zoom the image in the active window in and out. | Z/Z | 18 |
| | **Hand Cursor** | Use to view portions of the image not currently visible in the active window. | H/H | 18 |
| | **Open Multi-Image Window** | Open the Multi-Image window, where images in the selected folder can be previewed. | Ctrl + T/ cmd + T | 15 |
| | **Show Nikon Capture Camera Control** | Launch Nikon Capture 4 Camera Control. | — | 101 |
| | **Batch** | Open the Batch dialog, where you can select a folder of images for batch processing. | — | 88 |
| | **Open with Photoshop** | Open the image in the active window in Photoshop. | — | — |
| | **Show Original Image Data** | Hide the effects of changes to image adjustment settings. This button can not be used with RAW images taken with COOLPIX-series cameras. | — | — |
| | **Help** (Windows only) | When this button is clicked, a question mark appears next to the mouse pointer. Clicking on a window, menu, or button while the question mark is displayed will open the help file to the section that displays the function of the item clicked. | — | — |
| | **Auto Contrast** | Performs the same function as the **Auto Contrast** button in the Curves palette. | — | 44 |
| | **Color Booster** | Performs the same function as the **Auto** button in the Color Booster palette. | — | 59 |

* Windows keyboard shortcuts are listed first, Macintosh shortcuts second.

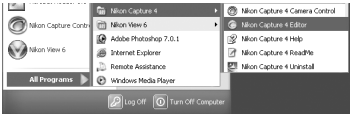
## Starting Nikon Capture 4 Editor

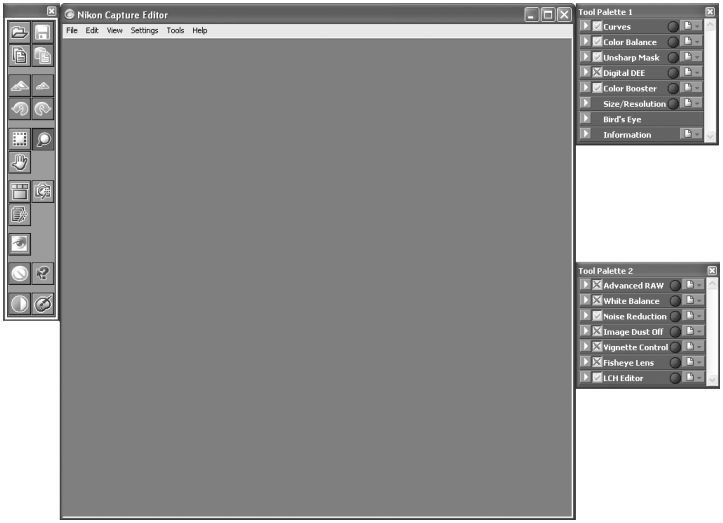
Nikon Capture 4 Editor can be started from the **Start** menu (Windows) or double-clicking the application icon (Macintosh).

### Windows

1 Turn the computer on
Turn the computer on and wait for the operating system to start up.

2 Start Nikon Capture 4 Editor
From the **Start** menu, select **All Programs** > **Nikon Capture 4** > **Nikon Capture 4 Editor** (Windows XP Home Edition/Windows XP Professional) or **Programs** > **Nikon Capture 4** > **Nikon Capture 4 Editor** (other versions of Windows).



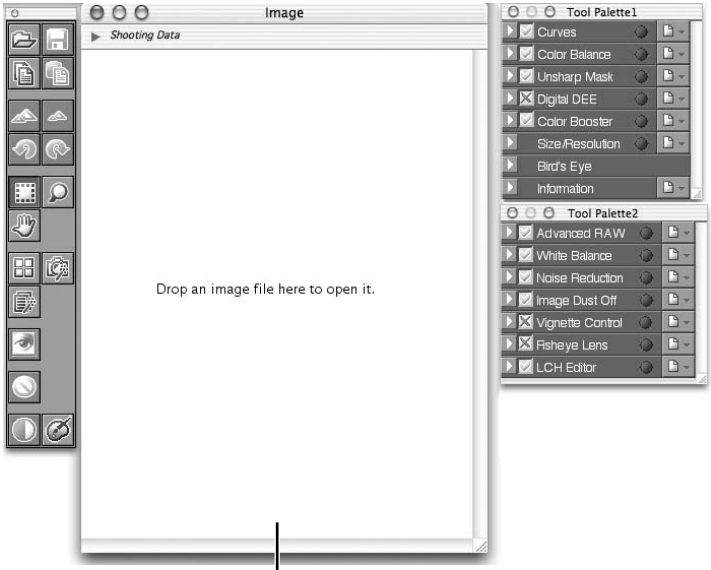

### Starting Image Window

In the Macintosh version of Nikon Capture 4, an empty image window is displayed when Nikon Capture 4 Editor is started by double-clicking the application icon. In the Windows version, the application window is displayed.

**Macintosh**

## 1 Turn the computer on
Turn the computer on and wait for the operating system to start up.

## 2 Start Nikon Capture 4 Editor
Double-click the Nikon Capture 4 Editor icon ( ) in the folder to which you installed Nikon Capture 4.




No image displayed in image window

**Product Key**

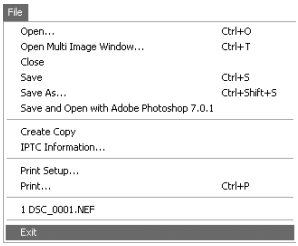
If prompted to supply a product key when starting Nikon Capture 4 Editor or Nikon Capture 4 Camera Control, enter the product key for Nikon Capture 4.

**Other Ways of Starting the Editor**

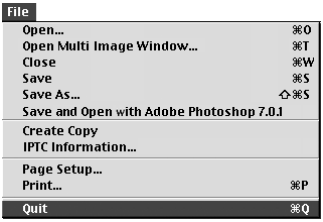
Nikon Capture 4 Editor can be started by double-clicking the Nikon Capture 4 icon ( ) in the folder to which you installed Nikon Capture 4 (Windows, Mac OS 9). If Nikon Capture 4 was registered in the Dock during installation, Mac OS X users will be able to start Nikon Capture 4 Editor by clicking the Nikon Capture 4 icon ( ) in the Dock.

## Exiting Nikon Capture 4 Editor

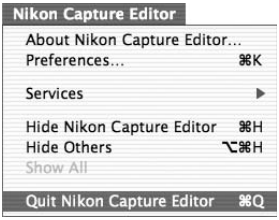
To close the Nikon Capture 4 Editor window and exit Nikon Capture 4, open the **File** menu and choose **Exit** (Windows) or **Quit** (Mac OS 9). In Mac OS X, select **Quit Nikon Capture Editor** from the application menu.




Windows




Mac OS 9




Mac OS X

## Opening Image Files

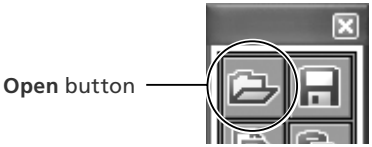
Nikon Capture 4 Editor can be used to open images created with Nikon digital cameras and images previously saved using Nikon Capture.

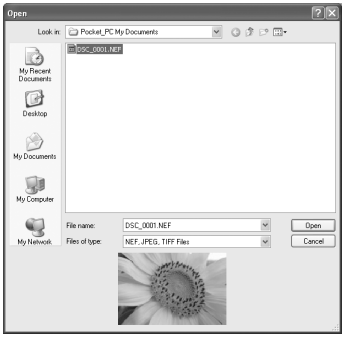
| Original image/saved image | Format | Extension |
|---|---|---|
| Uncompressed NEF (RAW) | NEF (Nikon Electronic Image Format) | .NEF |
| Compressed NEF (RAW) | | |
| Image saved in NEF | | |
| RGB-TIFF | TIFF (RGB) | .TIF |
| YCbCr TIFF | | |
| 16-bit TIFF (RGB) | | |
| 8-bit TIFF (RGB) | | |
| FINE | JPEG | .JPG |
| NORMAL | | |
| BASIC | | |
| JPEG | | |

Files in the above formats can be opened using the **Open…** command or by drag and drop.

### Using the "Open..." Command

1 Click the button or select **Open…** from the **File** menu
The standard Open dialog for your operating system will be displayed.




Preview of selected image displayed

**TIFF (CMYK) Images**

Images saved in TIFF (CMYK) format can not be reopened in Nikon Capture 4 Editor.

**NEF Files (Nikon Capture 3 or Earlier)**

NEF files created with Nikon Capture 4 can not be opened in earlier versions of Nikon Capture.

**RAW Images Created with the D1x**

The default size for RAW images created with the D1x when opened in Nikon Capture 4 Editor can be chosen using the **By default, a D1X RAW file will be** option in the General tab of the Nikon Capture 4 Editor Preferences dialog (95). Choose from six megapixels (3,008 × 1,960 pixels) and ten megapixels (4,016 × 2,616).

## 2 Locate the image file

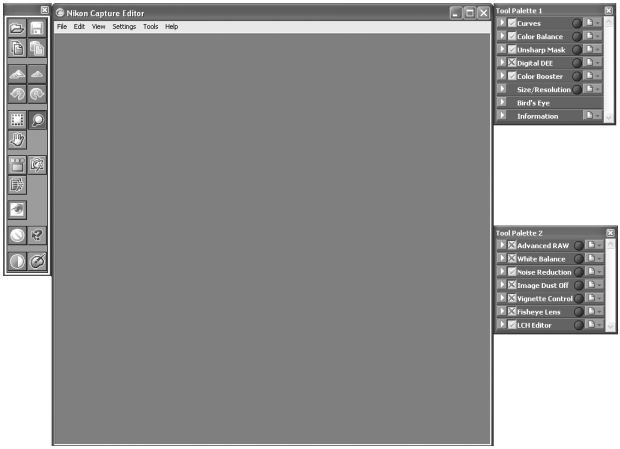
Navigate to the drive (volume) and folder containing the file you wish to open.

## 3 Click **Open**

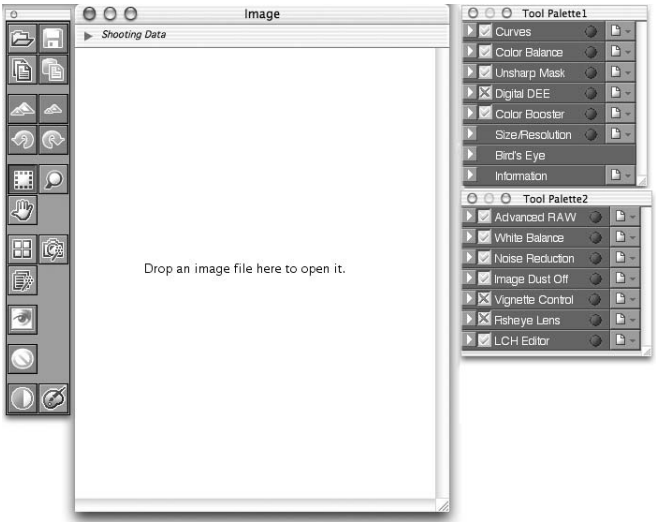
Double-click the file or select it from the files listed and click **Open**. The selected file will be opened in an image window in Nikon Capture 4 Editor.

### Using Drag and Drop

Images can also be opened by dragging them into the application window (Windows) or image window (Macintosh).




Windows

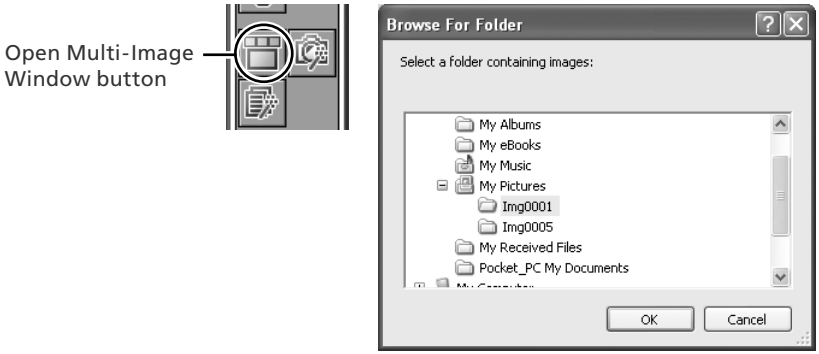



Macintosh

### Opening the Multi-Image Window

The Multi-Image window shows the images in the selected folder as small thumbnail previews. Use the Multi-Image window to view other images while making adjustments to the current image, or to select multiple images for editing, saving, or printing.

**1** Click the button or select **Open Multi-Image Window** from the **File** menu
The Browse For Folder dialog will be displayed.




**2** Select a folder
Select the folder containing images you want to view or edit.

**3** Click **OK**
The Multi-Image window will open, with the images in the selected folder displayed as thumbnails.

***Multi-Image window***
Lists the images in the selected folder.

***Thumbnail area***
Displays the images in the selected folder as thumbnail previews.

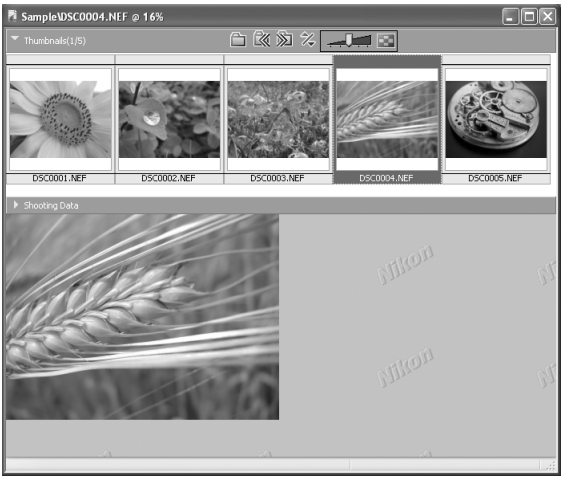
***Image area***
Shows the image currently being edited. Images are edited in the same way as in image windows (25).

**The Multi-Image Window**

The Multi Image window can be used to display multiple images without opening them in separate image windows, reducing the amount of memory required. It is not intended as an image browser. No more than one Multi-Image window can be open at a time. Before opening a folder in the Multi-Image window, make sure that none of the images in the selected folder are open in image windows. If the user attempts to open one of the images in the thumbnail list in an image window, it will be opened in the image area of the Multi-Image window instead.

## 4 Select a thumbnail

The corresponding image will be displayed in the image area.




### Editing Images

The image displayed in the image area can be edited in the same way as an image displayed in an image window (25). Modified images are indicated by an asterisk in the thumbnail list.

### Selecting Multiple Images

To select multiple images for printing or to save under another name, click the thumbnails while pressing the Ctrl (Windows) or command (Macintosh) key, or use the **Select All Images** or **Select All Unsaved Images** options in the **Multi-Image** menu. No image will be displayed in the image area.

### "Save As"

Even if the image in the Multi-Image window is saved under another name using the **Save As...** option, the original will still be displayed in the image area. If this image is saved using the **Save** option, any changes will be applied to the original, and the unmodified image will be lost. See "Saving Image Files" (82) for more information.

### Multi-Image Window Buttons

The names and functions of the buttons in the Multi-Image window are shown in the following table:

*When the thumbnail area is closed:*

| Button | Name | Function |
|---|---|---|
| | **Back to previous folder** | Return to the previous folder. |
| | **Foward to next folder** | Open the next folder. |
| | **Previous Image** | Display the previous image in the image area. |
| | **Next Image** | Display the next image in the image area. |

*When the thumbnail area is open:*

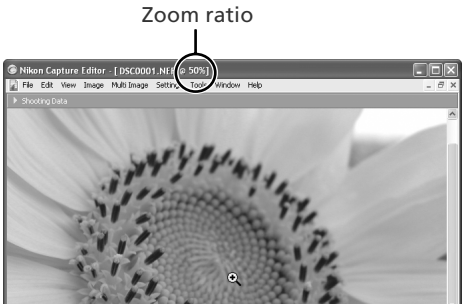
| Button | Name | Function |
|---|---|---|
| | **Select Folder** | Open the Browse For Folder dialog to select a folder for display in the Multi-Image window. |
| | **Back to previous folder** | Return to the previous folder. |
| | **Foward to next folder** | Open the next folder. |
| | **Sort** | A menu of sort options will be displayed. Choose **Sort Key** to sort images by **File Name**, **Date of Recording**, **Date Modified, File Name and Type**, **File Type and Date of Recording**, or **File Type and Date Modified** (if **File Type and Date of Recording**, or **File Type and Date Modified** is selected, images will be sorted by file type in the order NEF, JPEG, and TIFF, with images of the same file type sorted by date of recording or date of modification). Choose **Sort Order** to sort images in ascending or descending order. |
| | **Change Thumbnail Size** | Adjust the size of the thumbnails displayed in the Multi-Image window in five steps. |

**The Multi-Image Menu**

Although many operations can be performed using both the buttons in the Multi-Image window and the options in the **Multi-Image** menu, the explanations in this manual give priority to operations performed using the buttons in the Multi-Image window.

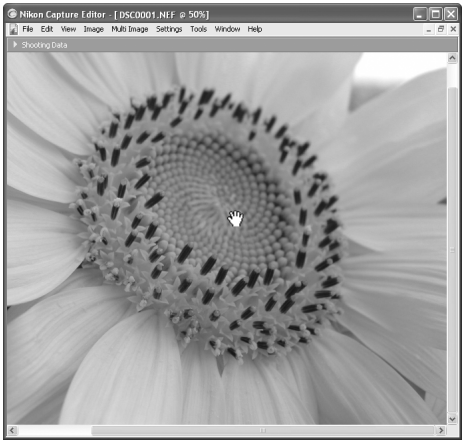
## Zoom

To zoom images in and out, click the button. The mouse pointer will change to a magnifying glass with a "+" sign in its center. Position the zoom cursor over the current image and click the mouse to zoom in one step. To zoom out one step, hold down Alt (Windows) or option (Macintosh). A "–" sign will appear in the center of the zoom cursor; click the mouse to zoom out one step. The image will be centered on the point clicked. The current zoom ratio is displayed in the title bar.


Zoom ratio
Nikon Capture Editor - [DSC0001.NEF @ 50%]
File Edit View Image Multi Image Settings Tools Window Help
Shooting Data

### Scrolling the Image

If the entire image is not visible at the current zoom ratio, the hand cursor can be used to view other areas of the image. To activate the hand cursor, click the button in the tool palette. The mouse pointer will change to ; to scroll the image, drag the mouse in the direction you want to go. You can also scroll the image using the scroll bars.




**Double-Clicking the and Buttons**

Double-clicking the button displays the image at a zoom ratio of 1 : 1. To fit the image to the window (Windows) or display the entire image (Macintosh), double-click the button.

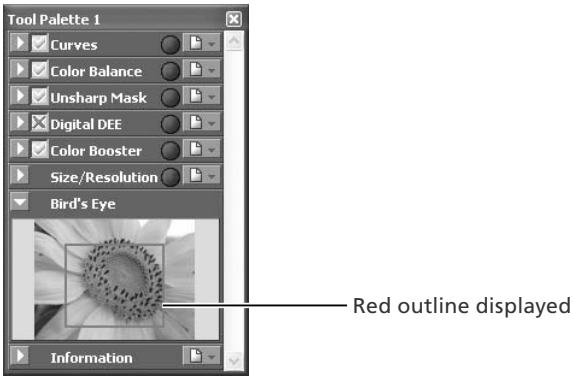
**The Hand, Zoom and Crop Cursors**

The hand, zoom, and crop cursors can not be used at the same time.

## The Bird's Eye Palette

The Bird's Eye palette shows the position of the portion of the image visible in the active image window. To display or hide the Bird's Eye palette, click the triangle in the Bird's Eye palette title bar (25). By default, the Bird's Eye palette is in Tool Palette 1.

The portion of the image visible in the active image window is indicated by a red outline.




When the mouse pointer is moved over the red outline, it changes to a cursor. Drag the red outline over the area of the image you would like to view. The selected area will be displayed in the active image window.

## Rotating and Flipping Images

The image in the active image window can be rotated or flipped as described below.

**Rotating Images**

Click the button or select **90 degrees CW** from the **Rotate** sub-menu to rotate the image in the active window 90 degrees to the right. Click the button or select **90 degrees CCW** from the **Rotate** sub-menu to rotate the image in the active window 90 degrees to the left. To rotate the image 180 degrees, select **180 degrees** from the **Rotate** sub-menu.

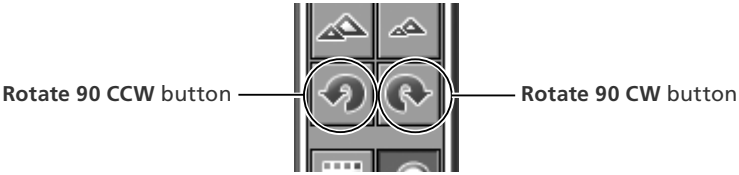


Image before rotation

Image rotated ninety degrees clockwise

**Flipping Images**

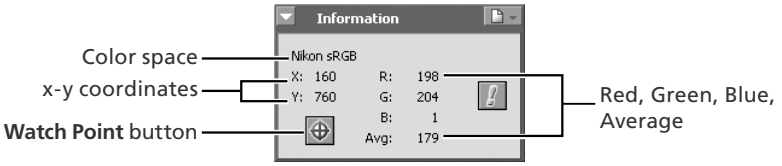
Use the commands in the **Flip** sub-menu to flip the image in the active window horizontally or vertically.

**Rotating JPEG Images**

Image files must be opened in Nikon Capture 4 Editor before being rotated. To save the changes, the image must then be saved to disk. If the image is in JPEG format, it will be compressed when saved, with a corresponding drop in image quality.

## The Information Palette

The information palette shows the position and color of the pixel under the mouse pointer. To display or hide the Information palette, click the triangle in the Information palette title bar (25). By default, the Information palette is in Tool Palette 1.



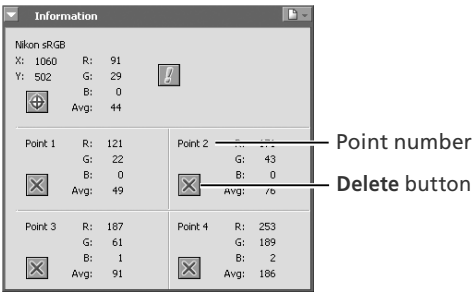

| Information | Description |
|---|---|
| Color space | The working color space for the image in the active image window is displayed at the top of the information palette. This information is embedded in the file when the image is saved. |
| R, G, B, Avg | The values for each of the red, green, and blue elements of the pixel under the cursor and the average of the three, weighted according to the properties of human color perception (the weighted average is calculated as (Red×0.299) + (Green×0.587) + (Blue×0.114)). Depending on the selected color space, the average may not reflect the actual luminance of the pixel under the cursor, but it can be used as a rough guide to brightness. Values for R, G, B, and the average of the three range from 0 to 255, with values for twelve-bit images being scaled to fit in this range. The number on the left is the input value, or value for the color in the original image. The value in the right is the output value, or value after any changes in the Curves or Color Adjustment windows have been applied. |
| x-y coordinates | The position of the cursor in the image window, measured in pixels from the top left corner of the image. |

### Monitoring Watch Points

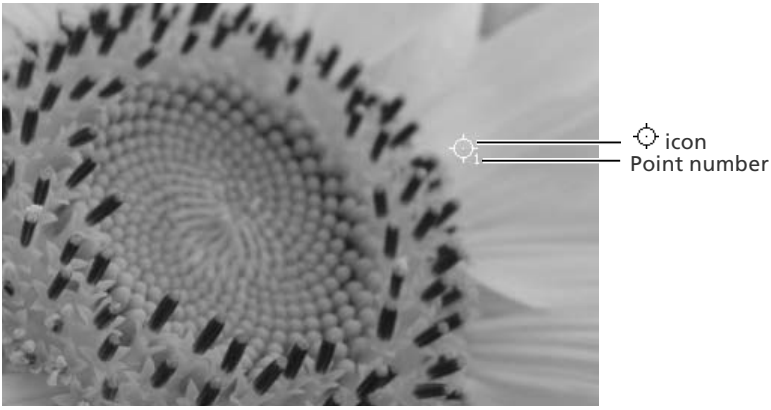
The Information palette can be used to continually monitor the red, green, blue, and average values (R, G, B, Avg) for up to four selected pixels. The "before" (input) and "after" (output) values for each of these pixels will be displayed in the Information palette, allowing you to determine the effects of any changes to settings.

*Selecting Watch Points*

To select a pixel to monitor, click the button. The cursor will change to Move the mouse over the desired pixel and click. The selected pixel will be added to the list of watch points in the Information palette.



The pixels currently being monitored in the Information palette are shown by a icon in the image window. Each point is identified by a number corresponding to the point number listed in the Information palette. You can monitor up to four pixels at a time.




*Moving a Watch Point*
To move the watch point to a new pixel, drag the icon in the image window.

*Deleting a Watch Point*
To remove a pixel from the list of watch points, click the button next to the corresponding listing in the Information palette, or drag the icon out of the image window. The remaining points will be renumbered to reflect the change.

**RGB and Average Values**
A warning button will be displayed in the information palette at zoom ratios of less than 100%. Clicking this button will display a dialog stating that accurate RGB and average values can not obtained at the current zoom ratio; click **Yes** to view the image full size.

**Preferences: Advanced Color**
Clicking the icon at the right end of the Information palette tool bar displays a menu from which you can access the Advanced Color tab of the Preferences dialog (96).

**Lost Highlights and Shadows**

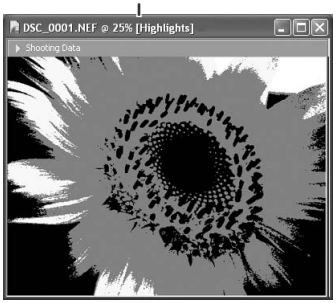
Areas of the image in which details in the high end or low ends of the tone range may have been lost ("lost" highlights or shadows) can be identified by locating pixels with the maximum or minimum value for one or more channel. This information can be used when using color balance (61) or adjusting the white point or black point to capture the optimal amount of detail without sacrificing contrast (47).

*Show Lost Highlights*

When **Show Lost Highlights** is selected in the **Image** menu, "lost" highlights (pixels with a value of 255 for one or more channel) are shown in color (see table below). Other pixels are shown in black.

| R | G | B | Shown in |
|---|---|---|---|
| "Lost" | "Lost" | "Lost" | White |
| "Lost" | "Lost" | Not "lost" | Yellow |
| "Lost" | Not "lost" | "Lost" | Magenta |
| Not "lost" | "Lost" | "Lost" | Cyan |
| "Lost" | Not "lost" | Not "lost" | Red |
| Not "lost" | "Lost" | Not "lost" | Green |
| Not "lost" | Not "lost" | "Lost" | Blue |

"Highlights" displayed in image window title bar

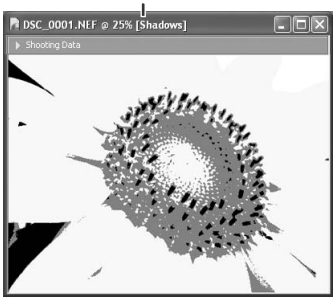



*Show Lost Shadows*

When **Show Lost Shadows** is selected in the **Image** menu, "lost" shadows (pixels with a value of 0 for one or more channel) are shown in color (see table below). Other pixels are shown in white.

| R | G | B | Shown in |
|---|---|---|---|
| "Lost" | "Lost" | "Lost" | Black |
| "Lost" | "Lost" | Not "lost" | Blue |
| "Lost" | Not "lost" | "Lost" | Green |
| Not "lost" | "Lost" | "Lost" | Red |
| "Lost" | Not "lost" | Not "lost" | Cyan |
| Not "lost" | "Lost" | Not "lost" | Magenta |
| Not "lost" | Not "lost" | "Lost" | Yellow |

"Shadows" displayed in image window title bar




**"Lost" Highlights and Shadows**

Before saving images in a format other than NEF, adjust settings to avoid "losing" highlights or shadows in large areas of the image. Information lost through editing can not be recovered once an image is saved in a format other than NEF.

**Keyboard Shortcuts**

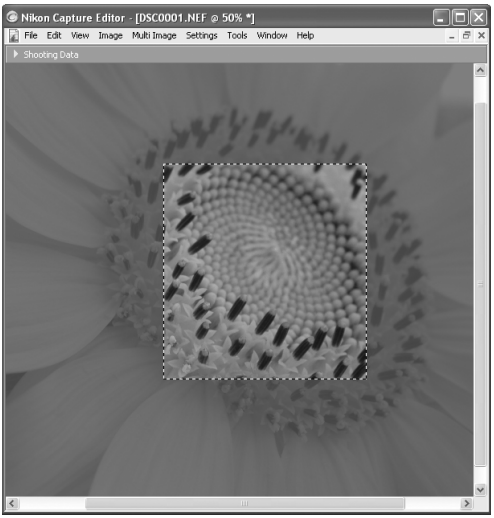
Press L to view or hide lost highlights, S to view or hide lost shadows.

## Selecting a Crop

Using the crop tool, you can select a portion of an image to be saved in a separate file. If no selection is made, the entire image will be saved.

1 Click the button or select **Crop Cursor** from the **View** menu
When the mouse is moved over the image area in the active window, it will change to (+).

2 Make a selection
Drag the mouse over the image in the active window to make a selection. The area outside the selection will be masked to show that it will be cropped.




### Cancelling the Current Crop

To cancel the current crop, double-click anywhere in the image window. The selection may not be cancelled if **Keep the output size** is selected in the Size/Resolution palette (75).

### Moving the Crop

To move the crop over a different part of the image, move the pointer over the crop. The pointer will change to a (Windows) or cursor (Macintosh). Drag the crop to move it to a new position.

### Changing the Size of the Crop

To change the size of the current crop, move the pointer over the borders of the crop. The pointer will change to a double arrow. Drag the borders of the crop to adjust its size. The size of the cropped image can be adjusted in the Size/Resolution palette (75).

**Saving a Selection**

Unless the image is saved in NEF format, only the selected portion of the image will be saved. Anything not included in the current crop will be deleted. In NEF format, the entire image is saved together with information about the location of the current crop.

# Image Adjustment

*Enhancing Images*

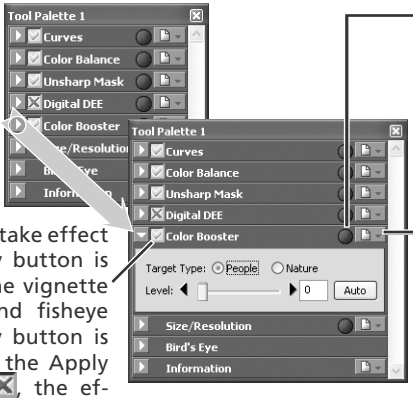
Before they will be ready for display or output on a monitor or printer, images captured from the camera will usually need to be adjusted to a size and resolution appropriate to the task at hand. Other settings, such as white balance, contrast, sharpness, luminosity, chroma, and hue, Image Dust Off, Digital DEE, fisheye lens settings, and automatic color settings for portraits or landscapes, may also require adjustment. These adjustments are performed using the image adjustment tool palettes.

### Using the Tool Palettes

To display the default tool palettes, select **Show Tool Palette 1** or **Show Tool Palette 2** from the **View** menu.

*Displaying the Contents of a Tool Palette*

To display or hide the contents of a tool palette, click the triangle to the left of the palette title.



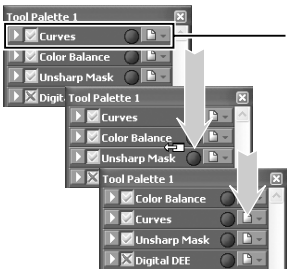

***Edit Indicator***
This indicator turns green if palette settings have been modified for the image in the active window.

***Apply Button***
Changes to settings only take effect when the palette Apply button is checked ☑ (except in the vignette control, Digital DEE, and fisheye lens palettes, the Apply button is checked by default). If the Apply button is crossed out ☒, the effects of the settings in the palette will not be visible in the image window.

***Settings Menu Button***
Click this button to display the settings submenu, where palette settings can be saved, loaded, or reset.

*Changing Palette Order*

To change the order of palettes in the tool palette window, click a tool palette title bar and drag it into a new position.




**The Size/Resolution Palette**

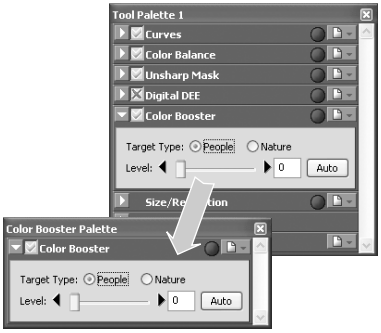
The Size/Resolution palette does not have an Apply button. Changes to settings in the Size/Resolution palette are always visible in the active window.

**Third-Party Plug-Ins**

Nikon Capture 4 supports third-party nik Color Efex Pro 2.0 for Nikon Capture 4 plug-ins that add a filter palette to Tool Palette 2. More information is available on-line (2).

*Opening Tool Palettes in Separate Windows*

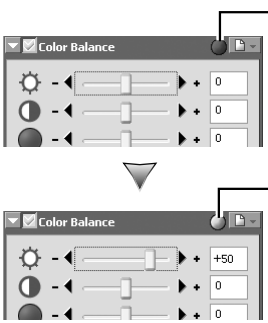
Tool palettes can be opened in a separate window by clicking the palette title and dragging it outside the current window to create a new tool palette window containing only the selected palette.




Tools can be added to the new window by dragging in additional palettes. The new window will be added to the **View** menu in Nikon Capture 4 Editor. If you close the new window by clicking the window close box, you can open it again by selecting the desired palette from the **View** menu.

*The Edit Indicator*

The edit indicator turns green if palette settings have been adjusted since the image in the active window was created (NEF) images or last saved (other images), making it clear at a glance which palettes have been used.




**Resetting the Tool Palettes**

To restore the tool palettes to their default positions, select **Reset Tool Positions** in the **View** menu.

The settings that can be adjusted depend on the image quality setting in effect when the photograph was recorded. Photographs taken at an image-quality setting of RAW can be processed to adjust white balance, reduce the effects of dust, perform vignette control, or to alter exposure compensation, image sharpening, tone compensation, color mode, and hue adjustment from the settings in effect at the time the photograph was taken. All images can be processed using the tools in the Curves, Color Balance, LCH Editor, Color Booster, Unsharp Mask, Noise Reduction, Digital DEE, and Size/Resolution palettes. Images taken with an AF DX 10.5 mm f2.8G fisheye Nikkor lens can also be processed to reduce distortion.

| Image quality | Process | Palette | |
|---|---|---|---|
| RAW | Adjust white balance. | White Balance | 29 |
| | Choose new settings for exposure compensation, image sharpening, tone compensation, color mode, and hue adjustment. | Advanced RAW | 35 |
| | Reduce effects of dust on the low-pass filter protecting the camera CCD. | Image Dust Off | 38 |
| | Compensate for drop in marginal lumination caused by characteristics of camera lens. | Vignette Control | 42 |
| RAW<br>RGB-TIFF<br>YCbCr-TIFF<br>FINE<br>NORMAL<br>BASIC | Adjust tone, color balance, and contrast. There are two distinct tools for this task: the Curves palette, which provides precise control over tone, and the Color Balance palette, which features simpler controls. | Curves | 44 |
| | | Color Balance | 61 |
| | Adjust luminosity (lightness), chroma (color saturation, or vividness), and hue. | LCH Editor | 54 |
| | Adjust color automatically according to the subject. | Color Booster | 59 |
| | If the image lacks definition, you can sharpen outlines using the controls in the Unsharp Mask palette. Unsharp mask only be applied at the last step, after all other adjustments have been made. | Unsharp Mask | 64 |
| | Reduce the noise common to pictures taken with digital cameras. Nikon Capture supports color noise reduction, edge noise reduction, and color moiré reduction (RAW images only). | Noise Reduction | 67 |
| | Increase detail in shadows or highlights. | Digital DEE | 69 |
| | Process pictures taken with an AF DX 10.5mm f2.8G fisheye Nikkor lens to reduce distortion at the edges of the frame, making them look like images taken with a wide-angle lens. | Fisheye Lens | 73 |
| | Adjust the size and resolution of the image for output on a particular device. | Size/Resolution | 75 |

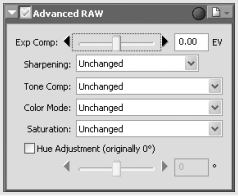
### The Curves Tool and the LCH Editor

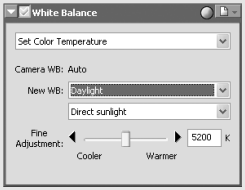
The Curves tool controls the distribution of tones in the red, green, and blue channels and in the RGB master channel, and provides visual feedback on the amount of tone information lost through editing. The LCH Editor is a better tool for making fine adjustments to luminosity (brightness), color saturation, and hue; note, however, that changes to these settings may produce results that exceed the dynamic range of the RGB channels.

Suggested steps for processing images are shown below.

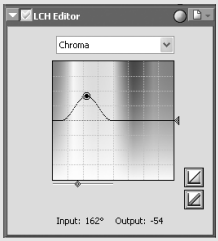
## RAW Images

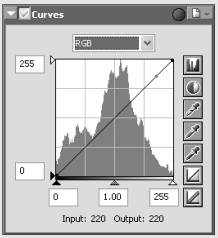
Use the Advanced RAW and White Balance tools to adjust the originals.



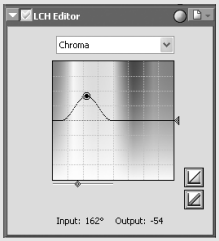

The LCH Editor can then be used to adjust luminosity, saturation, and hue, the Curves tool to fine-tune the distribution of tones in the red, green, blue, and master channels.

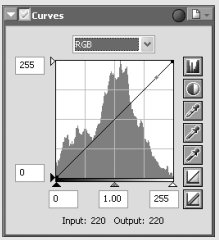


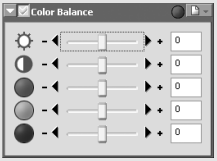

## TIFF and JPEG Images

Use the LCH Editor and the Curves tool to fine-tune luminosity, saturation, hue, and tone distribution.




Use the Color Balance or Color Booster tool for quick visual adjustments to color.

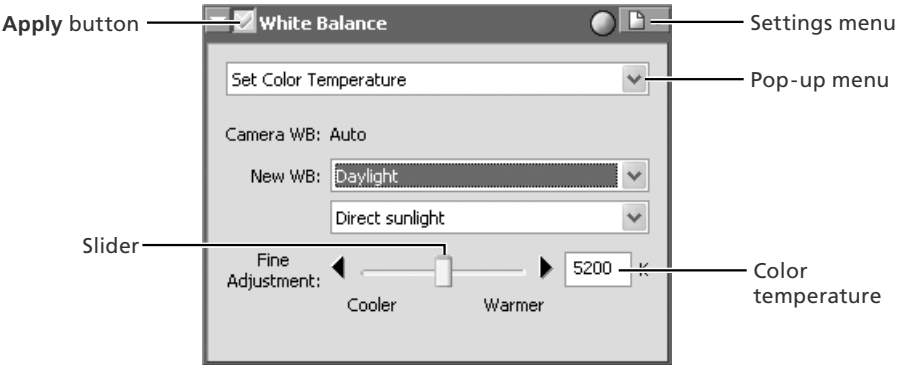


## White Balance

The tools in the White Balance palette are used to adjust white balance for RAW images. Using these tools, not only can you correct white balance when the setting chosen with the camera failed to produce the desired effect, you can also deliberately alter white balance to introduce a cold or warm cast into the image. Users of the D2H and D70 can copy white-balance settings to the camera or memory card (32). White balance can be adjusted by specifying the desired color temperature or by sampling the image for the gray point.

### Specifying a Color Temperature

**1** Display the White Balance palette
Select the tool palette containing the White Balance palette from the **View** menu (the default location for the White Balance palette is Tool Palette 2) and click the triangle at the top left corner of the palette.




**2** If the Apply button is off (☒) , turn it on (☑)
If the **Apply** button is off, the image in the active image window will reflect the white balance settings in effect at the time the photograph is taken.

**3** Select **Set Color Temperature**
Select **Set Color Temperature** from the pop-up menu at the top of the palette.

**White Balance**

White balance can be performed on RAW images only. If the image in the active window is JPEG or TIFF, the Apply button in the White Balance palette will be grayed out and inactive.

**"Mired"**

Any given change in color temperature produces a greater difference in color at low color temperatures than it would at higher color temperatures. For example, at a color temperature of 6000 K, a change of 100 K produces almost no change in color, while a change of the same amount at 3000 K would produce a large difference in color. Mired, calculated by multiplying the inverse of the color temperature by $10^6$, is a measure of color temperature that takes such variation into account, and as such is the unit used in color-temperature compensation filters.

| Change in Color Temp. | Mired |
|---|---|
| 4000 K – 3000 K = 1000 K | 83 mired |
| 7000 K – 6000 K = 1000 K | 24 mired |

## 4 Adjust white balance using the options in the White Balance palette

### Camera WB

Shows the white balance setting in effect at the time the photograph was taken and the amount of fine-tuning performed.

### New WB

The white balance setting to be applied to the captured image can be chosen from the options listed in the table below. When **Daylight**, **Standard Fluorescent**, or **High Color Rendering Fluorescent** is selected, white balance can be fine-tuned by selecting an option from the sub-menu.

| Option | Sub-menu option | Color temperature | Description |
|---|---|---|---|
| **Use Gray Point** | — | — | White balance is set to the value chosen in the gray-point selection dialog (31). |
| **Recorded Value** | — | — | White balance is set to the value recorded when the picture was taken. |
| **Calculate Automatically*** | — | — | White balance is adjusted automatically based on the white balance of the original image. |
| **Incandescent** | — | 3,000 K | Suited to photos taken under incandescent lighting. |
| **Daylight** | **Direct sunlight** | 5,200 K | Suited to photos taken in direct sunlight. |
| | **Cloudy** | 6,000 K | Suited to photos taken under overcast skies. |
| | **Shade** | 8,000 K | Suited to photos taken in the shade on sunny days. |
| **Standard Fluorescent**<br>**High Color Rendering Fluorescent** | **Warm White (3000K)** | 3,000 K | Suited to fluorescent lighting, including lighting with a noticeable color cast. The type of bulb can be chosen from a sub-menu of five options. |
| | **3700K** | 3,700 K | |
| | **Cool White (4100K)** | 4,100 K | |
| | **5000K** | 5,000 K | |
| | **Daylight (6500K)** | 6,500 K | |
| **Flash** | — | 5,400 K | Suited to photos taken with Nikon Speedlights. |

* If a settings file in which **Calculate Automatically** has been selected for white balance is applied to multiple images in the Multi Image window, a ⚠ icon may appear on some images. This indicates that the recorded value will be used until the images are opened in the image area, at which time a new white balance value will be calculated automatically.

### Fine Adjustment

Color temperature can be fine-tuned using this slider. This option is not available when **Use Gray Point** or **Recorded Value** is selected for **New WB**. Color temperature can be adjusted by ±50 mired. Note that color temperature can not be raised above 9090 K, and that a setting of **Flash** can be fine-tuned in the range of 4255K–7407 K.

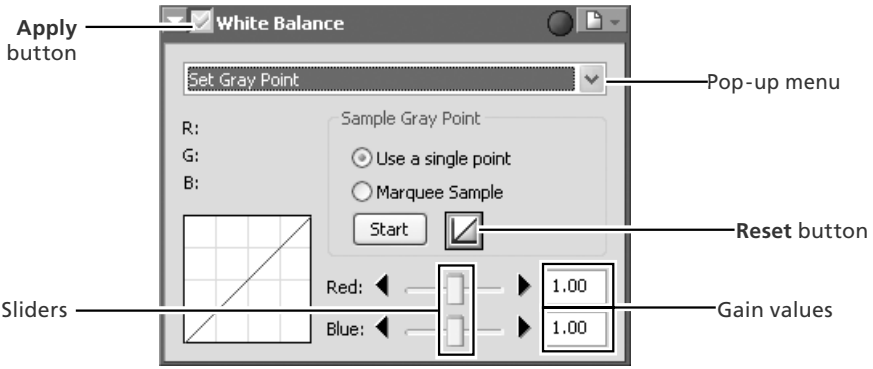
**"Calculate Automatically"**

The **Calculate Automatically** option is not available in the case of photographs taken with the COOLPIX series. **Calculate Automatically** may not produce the desired results with all images; if necessary, use another white balance setting, adjust white balance using the **Fine Adjustment** slider, or sample the image for gray point (31).

**Sampling the Image for Gray Point**

1 Select **Set Gray Point**
Select **Set Gray Point** from the pop-up menu at the top of the White Balance palette.

2 If the Apply button is off (☒) , turn it on (☑)




3 Sample the image to choose a reference point for white balance
White balance can be defined using a single pixel or the average of the values for all pixels in a selected area. During sampling, the values for red (R), green (G), and blue (B) for the pixel under the cursor will be shown in the White Balance palette. Refer to these values when selecting the point or points to be sampled.

*Using a Single Point to Define White Balance*

After selecting **Use a single point**, click **Start**. The cursor will take the shape of an eyedropper (🖉) when moved over the image in the active window. Click a point that you would like to appear a neutral gray color in the final image. The new value for white balance will be reflected in the image in the active window.

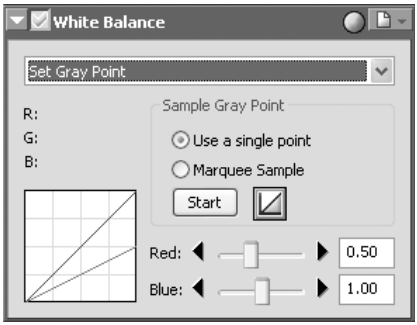
*Using the Average of the Area Sampled to Define White Balance*

After selecting **Marquee Sample**, click **Start**. The cursor will take the shape of an area-selection eyedropper (↖) when moved over the image in the active window; drag the mouse over the image to select an area. White balance will be set to the average for the selected areas, and the image in the active window will be updated to reflect the new value for white balance.

**Sample Size**

The size of the area sampled with the eyedropper cursor can be set using the **Dropper sample size** option in the Advanced Color tab of the Preferences dialog.

Gain for the red and blue channels will be adjusted based on the points sampled, changing the slope of the red and blue tone curves and the position of the red and blue sliders.




White balance can also be adjusted by moving the red and blue sliders or by entering a value from 0.1 to 10 in the text boxes to their right.

Reset
Click this button to reset the red and blue curves to the default value for gain (1.0).

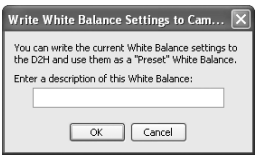
Red slider/Blue slider
Adjust gain by moving these sliders or entering a value from 0.1 to 10 in the text boxes to their right.

**Copying White Balance to the Camera (D2H and D70 Only)**

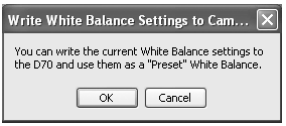
If the image in the active window is a RAW image taken with the D2H or D70, the new white-balance value can be copied directly to one of the camera's white-balance presets or recorded to the camera memory card. Before copying a value to the camera, make sure the camera is connected and turned on. Before copying a value to the memory card, remove the card from the camera and insert it in a CF card reader or card slot.

1 Select **Write settings to camera...** from the white balance settings menu

The dialog shown at right will be displayed. Enter a descriptive comment of up to thirty-six characters (D2H only) and click **OK**.


Write White Balance Settings to Cam...
You can write the current White Balance settings to the D2H and use them as a "Preset" White Balance.
Enter a description of this White Balance:
OK
Cancel

D2H


Write White Balance Settings to Cam...
You can write the current White Balance settings to the D70 and use them as a "Preset" White Balance.
OK
Cancel

D70

**Choosing a Value for Gain**

Very large and small values for gain can result in a drop in image quality.

**Copying White Balance to the Camera (D2H and D70 Only)**

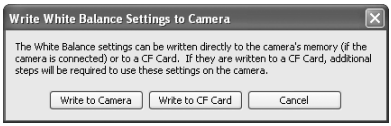
Nikon Capture 4 Editor supports a wider range of values for gain than does the D2H or D70. When white-balance settings are copied to the camera, values that exceed the range of the D2H or D70 will automatically be adjusted to values supported by the camera. Choose values between 0.1 and 2 when using the **Write setting to camera** option.

**Gain**

The values for red and blue gain chosen in the White Balance palette are multiples of the value set for gain when the photograph was taken.

## 2 Choose an option

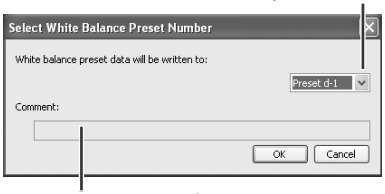
The dialog shown at right will be displayed. Click **Write to camera**, **Write to CF card**, or **Cancel**.


Write White Balance Settings to Camera
The White Balance settings can be written directly to the camera's memory (if the camera is connected) or to a CF Card. If they are written to a CF Card, additional steps will be required to use these settings on the camera.
Write to Camera
Write to CF Card
Cancel

### Write to camera

Copy white balance from the White Balance palette to the camera. If the D2H is connected, the dialog shown at right will be displayed. Choose a preset from the pop-up menu and click **OK**. The new value for the selected preset can be confirmed from the camera or Nikon Capture 4 Camera Control.

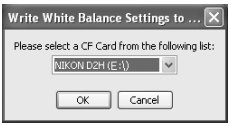
White balance preset menu

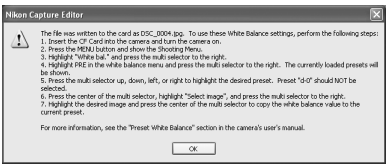



Existing comment for selected preset

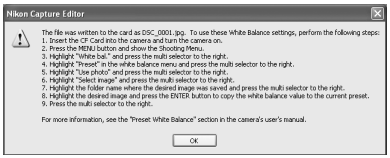
### Write to CF card

The dialog shown at right will be displayed. Choose the drive containing the camera memory card from the pop-up menu and click **OK** to copy the new white-balance value to the camera memory card. A dialog showing the name of the new file will be displayed; click **OK** to close the dialog.





Nikon Capture Editor
The file was written to the card as DSC_0004.jpg. To use these White Balance settings, perform the following steps:
1. Insert the CF Card into the camera and turn the camera on.
2. Press the MENU button and show the Shooting Menu.
3. Highlight "White bal." and press the multi selector to the right.
4. Highlight PRE in the white balance menu and press the multi selector to the right. The currently loaded presets will be shown.
5. Press the multi selector up, down, left, or right to highlight the desired preset. Preset "d-0" should NOT be selected.
6. Press the center of the multi selector, highlight "Select image", and press the multi selector to the right.
7. Highlight the desired image and press the center of the multi selector to copy the white balance value to the current preset.
For more information, see the "Preset White Balance" section in the camera's user's manual.
OK

D2H


Nikon Capture Editor
The file was written to the card as DSC_0001.jpg. To use these White Balance settings, perform the following steps:
1. Insert the CF Card into the camera and turn the camera on.
2. Press the MENU button and show the Shooting Menu.
3. Highlight "White bal." and press the multi selector to the right.
4. Highlight "Preset" in the white balance menu and press the multi selector to the right.
5. Highlight "Use photo" and press the multi selector to the right.
6. Highlight "Select image" and press the multi selector to the right.
7. Highlight the folder name where the desired image was saved and press the multi selector to the right.
8. Highlight the desired image and press the ENTER button to copy the white balance value to the current preset.
9. Press the multi selector to the right.
For more information, see the "Preset White Balance" section in the camera's user's manual.
OK

D70

### Cancel

Exit without copying white balance to the camera or memory card.

**"Write to Camera"**

Before connecting the camera to the computer, set the **USB** option in the camera setup menu to **PTP**.

**"Write to CF Card"**

Nikon Capture 4 writes the new value for white balance to the folder with the highest folder number. If this folder already contains 999 images, the camera may not recognize the file containing the new value for white balance.

**Reading White Balance from the Memory Card**

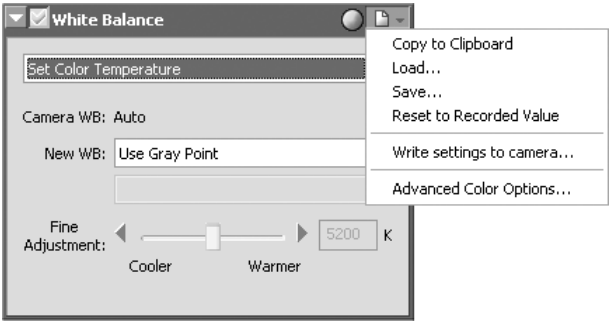
For information on reading white balance values from the memory card, see the *Guide to Digital Photography* for the D2H or D70.

**Comments (D2H only)**

In addition to letters and numbers, comments can contain quotes, apostrophes, spaces, and any of the following characters: "," "." "!" "?" "#" "$" "%" "&" "(" ")" "[" "]" "{" "}" "*" "+" "-" "/" ":" ";" "<" "=" ">" "_" and "@".

### The White Balance Settings Menu

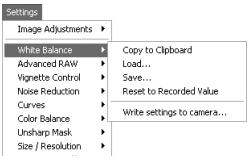
Clicking the icon in the White Balance palette displays the White Balance Settings menu.




| Option | Description |
|---|---|
| **Copy to Clipboard** | Copy current white balance settings to the clipboard. |
| **Load...** | Select this item to restore white balance to settings saved using the **Save...** option (see below). A dialog will be displayed where you can navigate to the drive (volume) and directory containing the desired settings file (only files with the extension ".nwb" will be displayed). The settings in the White Balance palette will instantly revert to the saved settings. |
| **Save...** | Select this item to save current white balance settings to a named file. These settings can later be recalled using the **Load...** option. Choosing **Save...** displays a dialog where you can choose a destination and file name for the current white balance settings. White balance settings are saved with the extension ".nwb". |
| **Reset to Recorded Value** | Selecting this item restores the value for white balance in effect at the time the photograph was taken. |
| **Write settings to camera...** | If the image in the active window was taken with the D2H or D70, select this option to copy white balance to a white-balance preset or the camera memory card (32). |
| Recent files | Recent white balance settings files (up to four) are listed at the end of the settings menu. Selecting a file from the list sets the controls in White Balance palette to the saved settings. |
| **Advanced Color Options...** | Open the Nikon Capture 4 Editor Preferences dialog to the Advanced Color tab (96). |

### The Settings Menu

The White Balance Settings menu can also be displayed by selecting **White Balance** from the **Settings** menu.

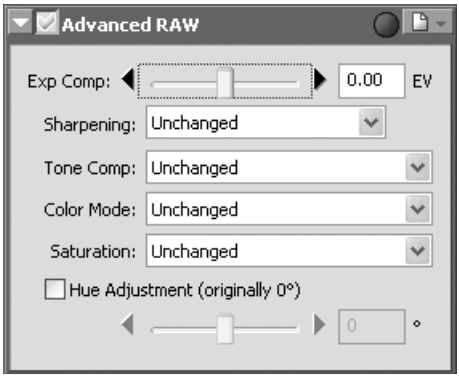


## Advanced RAW

The options in the Advanced RAW palette are used to alter exposure compensation, image sharpening, tone compensation, color mode, and hue adjustment from the settings in effect at the time the photograph was taken.

1 Display the Advanced RAW palette

Select the tool palette containing the Advanced RAW palette from the **View** menu (the default location for the Advanced RAW palette is Tool Palette 2) and click the triangle at the top left corner of the palette.




2 If the Apply button is off ( ) , turn it on ( )

3 Adjust Advanced RAW settings

Exp Comp

Choose a value from –2 to +2 EV using the slider or enter a value in the text box to its right. Choose 0 to perform no compensation.

Sharpening

Adjust the sharpness of outlines in the image according to the scene or your personal preference. Choose from **Unchanged**, **None**, **Low**, **Medium Low**, **Normal**, **Medium High** or **High**. In the case of photographs taken with D1, **Normal** is equivalent to **None**.

**The Warning Button**

A warning button appears if the image in the active window is displayed at a zoom ratio too low to allow the effects of Advanced Raw settings to be displayed. Click the button to view the warning.

**Advanced RAW**

Advanced RAW can be performed on RAW images only. If the image in the active window is JPEG or TIFF, the Apply button in the Advanced Raw palette will be grayed out and inactive.

### Tone Comp

Adjust image contrast. Choose from **Unchanged**, **Low Contrast**, **Medium Low**, **Normal**, **Medium High**, **High Contrast**, or **User-Defined Custom Curve**. Because the D1 does not store custom curves in the image file, settings of **User-Defined Custom Curve** are equivalent to **Normal** when selected with photographs taken with the D1. With the D1x, D1H, D2H, D100 and D70, selecting **User-Defined Custom Curve** restores the tone curve in effect at the time the photograph was taken.

### Color Mode

Choose a color mode for fine control over chroma, brightness, and color gamut, much as you would choose different kinds of color film for different scenes. Choose from **Unchanged**, **Mode I (sRGB)**, **Mode II (Adobe RGB)**, **Mode III (sRGB)**, **Mode Ia (sRGB)**, or **Mode IIIa (sRGB)**. In the case of images taken with the D1, **Unchanged** is equivalent to D1 Mode (NTSC). Color mode selection is available only in the case of RAW images taken with D1-series, D2H, D100, or D70 cameras.

### Saturation

Adjust the vividness of colors. Choose from **Unchanged**, **Moderate**, **Normal**, or **Enhanced**.

### Hue Adjustment

Adjusts hue without affecting brightness or saturation. Hue can be adjusted in the range –9° to 9° in seven steps of 3°. If red is taken as the starting color, raising hue above 0° (the default setting, at which hue is unchanged) would introduce a yellow cast, making colors that would be red at a setting of 0° appear increasingly orange. Lowering hue below 0° would introduce a blue cast, making colors that would be red at a setting of 0° appear increasingly purple (in the case of the D1x and D1H, –9° is equivalent to a camera hue setting of 0, 0° to a setting of 3, and 9° to a setting of 6). To use the value for hue adjustment in effect at the time the photograph was taken, turn the **Hue Adjustment** check box off.

**The Sharpening, Tone Comp., and Color Mode Menus**

In the case of images taken with D1-series, D2H, D100, or D70 cameras, the sharpening, tone compensation, and color mode settings in effect at the time the photograph was taken are marked with an asterisk (no asterisk will be displayed if "Auto" was selected for sharpening or tone compensation).

**Color Mode**

Color Mode settings apply only to photographs taken with D1-series, D2H, D100, or D70 cameras. Modes I and Ia, which are adapted to the sRGB color space, are suited to portraits that will be printed or used "as is" with little or no modification. Mode II is adapted to the Adobe RGB color space. This color space is capable of expressing a wider gamut of colors than sRGB, making it the preferred choice for pictures that will be extensively processed or retouched. Modes III and IIIa, which are adapted to the sRGB color space, are suited to nature or landscape shots that will be printed or used "as is" with little or no modification.

**Sharpening and Tone Comp Options for COOLPIX Cameras**

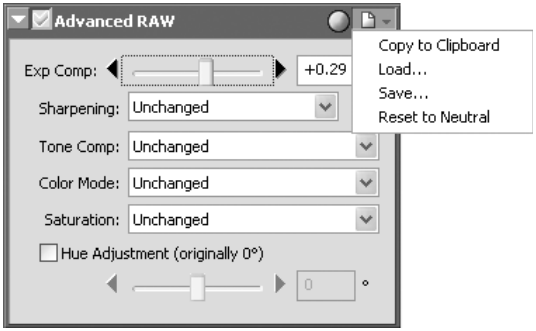
**Tone Comp**>**User-Defined Custom Curve** and the **Medium Low** and **Medium High** options for **Sharpening** and **Tone Comp** are not available with COOLPIX-series cameras.

**Saturation**

The Saturation option in Nikon Capture 4 Editor can be used to change vividness of images without affecting hue.

### The Advanced RAW Settings Menu

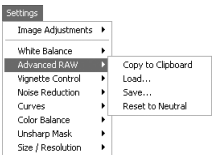
Clicking the button in the Advanced RAW palette displays the Advanced RAW settings menu.




| Option | Description |
|---|---|
| **Copy to Clipboard** | Copy current Advanced RAW settings to the clipboard. |
| **Load...** | Select this item to restore Advanced Raw settings to settings saved using the **Save...** option (see below). A dialog will be displayed where you can navigate to the drive (volume) and directory containing the desired settings file (only files with the extension ".nar" will be displayed). The settings in the Advanced Raw palette will instantly revert to the saved settings. |
| **Save...** | Select this item to save current Advanced Raw settings to a named file. These settings can later be recalled using the **Load...** option. Choosing **Save...** displays a dialog where you can choose a destination and file name for the current white balance settings. Advanced Raw settings are saved with the extension ".nar". |
| **Reset to Neutral** | Selecting this item restores the settings in effect at the time the photograph was taken. |
| Recent files | Recent Advanced RAW settings files (up to four) are listed at the end of the settings menu. Selecting a file from the list sets the controls in Advance RAW palette to the saved settings. |

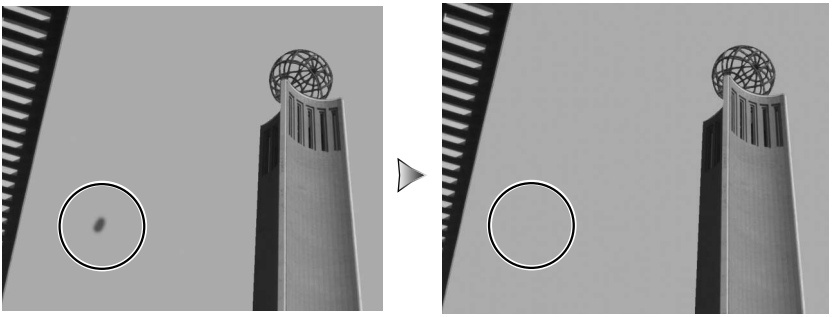
### The Settings Menu

The Advanced RAW Settings menu can also be displayed by selecting **Advanced RAW** from the **Settings** menu.



## Image Dust Off

Image Dust Off compares RAW photographs with a reference image created with the same camera to reduce the effects of any dust that may be present on the low-pass filter protecting the camera's imaging sensor.



Before Image Dust Off

After Image Dust Off

*Image Dust Off*

Image Dust Off only affects relatively featureless areas of the image.

### 1 Display the Image Dust Off palette

Select the tool palette containing the Image Dust Off palette from the **View** menu (the default location for the Image Dust Off palette is Tool Palette 2) and click the triangle at the top left corner of the palette.

### 2 Turn the Apply button on (☑)

Turn the Apply button on (☑) to enable Image Dust Off.

### 3 Click **Change...**

Click **Change...** to select a reference image for Image Dust Off. Image Dust Off will be performed when the image is selected. The date of creation of the selected file will be displayed under "Image Dust Off reference image was taken at" in the Image Dust Off tool palette.

**Image Dust Off**

Image Dust Off can be performed on RAW images only. If the image in the active window is JPEG or TIFF, the Apply button in the Image Dust Off palette will be grayed out and inactive.

**Cameras That Support Image Dust-Off**

The following cameras support Image Dust Off: D1X / D1H (firmware version 1.10 or later), D2H, D100, and D70. Image Dust Off is not supported with COOLPIX cameras, D1 cameras, or with earlier versions of the camera firmware for the D1X and D1H.

**Reference Images**

The position and amount of dust on the low-pass filter may change. If possible, take reference images regularly and use a reference image taken within one day of the selected photograph.

*Images Taken with the D2H or D70*

If the current image was created with the D2H or D70, Nikon Capture 4 Editor will search for reference files created with the camera Image Dust Off option (extension ".ndf"). If it finds a reference file in the same folder as the current image, a message will be displayed. Click **Yes** to use this file as a reference.

If the folder contains more than one reference file, clicking **Yes** will display the dialog shown at right. Select a file for use with Image Dust Off.

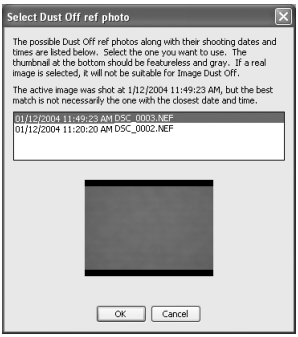
Select Dust Off ref photo
More than one suitable Dust Off ref photo was found. Select the one you wish to use based on its shooting date and time.
The active image was shot at 1/8/2004 4:33:29 AM, but the best match is not necessarily the one with the closest date and time.
01/13/2004 8:55:41 PM
01/13/2004 2:22:23 AM
OK
Cancel

If the user clicks **No** or the current folder does not contain an image created with the camera Image Dust Off option, a folder selection dialog will be displayed. Select a folder containing Image Dust Off reference data.

*Images Taken with Other Cameras*

If the image in the active window was not created with the D2H or D70, a folder selection dialog will be displayed. Select the folder containing the desired Image Dust Off reference photo and click **OK**. Nikon Capture 4 Editor will display a message offering to search for reference file applies to the current image. Click **Yes** to start the search; if Nikon Capture 4 Editor finds a suitable file, this will be used as a reference for Image Dust Off. If more than one suitable file is found, the dialog shown at right will be displayed. Select a reference file for Image Dust Off.

Select Dust Off ref photo
More than one suitable Dust Off ref photo was found. Select the one you wish to use based on its shooting date and time.
The active image was shot at 1/12/2004 11:49:23 AM, but the best match is not necessarily the one with the closest date and time.
01/12/2004 11:49:23 AM
01/12/2004 11:20:20 AM
OK
Cancel


Select Dust Off ref photo
The possible Dust Off ref photos along with their shooting dates and times are listed below. Select the one you want to use. The thumbnail at the bottom should be featureless and gray. If a real image is selected, it will not be suitable for Image Dust Off.
The active image was shot at 1/12/2004 11:49:23 AM, but the best match is not necessarily the one with the closest date and time.
01/12/2004 11:49:23 AM DSC_0003.NEF
01/12/2004 11:20:20 AM DSC_0002.NEF
OK
Cancel

Clicking **No** will display a list of all Dust Off ref photos. Select the file that will be used as a reference for processing the current image.

**Excessive Dust**

If a large amount of dust is detected in the current image, Nikon Capture 4 Editor will display a warning stating that the results of Image Dust Off can not be guaranteed. Click **Yes** to proceed.

**No Suitable Images Found**

If none of the Image Dust Off reference files found is suitable for use with the image in the active window, Nikon Capture 4 Editor will display a message to this effect and offer to use the most suitable reference image. Clicking **Yes** displays a list of the most suitable reference images; select a reference file to process the image in the active window to reduce the effects of dust.

**Creating Dust Off Ref Photos**

To create a Dust Off ref photo for cameras other than the D2H or D70:

1 Select a CPU lens

Mount a CPU lens on the camera. We recommend using a lens with a focal length of at least 50 mm. If using a zoom lens, zoom in to the maximum telephoto position.

2 Adjust camera settings

Choose the following settings:

- Sensitivity (ISO equivalency): minimum setting
- Image quality: NEF (RAW)
- Exposure mode: aperture-priority auto (A)
- Aperture: minimum aperture (largest f/-number)
- Focus: choose manual focus and set focus to infinity

3 Take a photograph

With the lens about 10 cm from a featureless white object, such as a wall, frame the object so that it fills the viewfinder and take a photograph. The resulting Dust Off ref photo will be recorded as an NEF (RAW) image.

4 Transfer the photograph to the computer

Use Nikon Transfer to copy the photograph to the computer.

**Creating Dust Off Ref Photos (D1-Series and D100 Cameras)**

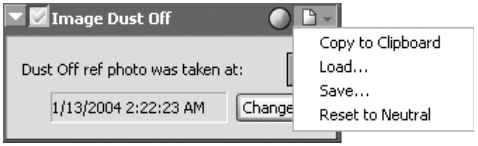
In addition to D2H and D70 cameras, Dust Off ref photos can be taken with the D1X / D1H (firmware version 1.10 or later), and D100. Dust Off ref photos can not be created with the D1 or with earlier versions of the camera firmware for the D1X and D1H. Dust Off ref photos taken with the D100, D1X, or D1H have the extension ".nef"; do not change this extension.

**Camera Shake**

A slight amount of blurring caused by camera shake will not affect Dust Off ref photos.

### The Image Dust Off Settings Menu

Clicking the button in the Image Dust Off palette displays the Image Dust Off Settings menu.



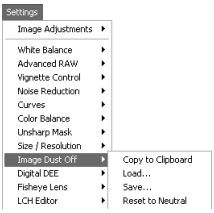

| Option | Description |
|---|---|
| **Copy to Clipboard** | Copy current Image Dust Off settings to the clipboard. |
| **Load...** | Select this item to load Image Dust Off settings previously saved using the **Save...** option (see below). A dialog will be displayed where you can navigate to the drive (volume) and directory containing the desired settings file (only files with the extension ".ndr" will be displayed). The settings in the Image Dust Off palette will instantly revert to the saved settings. |
| **Save...** | Select this item to save Image Dust Off settings to a named file. These settings can later be recalled using the **Load...** option. Choosing **Save...** displays a dialog where you can choose a destination and file name for the current Image Dust Off settings. Image Dust Off settings are saved with the extension ".ndr". |
| **Reset to Neutral** | Clears the name of the current Image Dust Off reference file from the Image Dust Off palette. |
| Recent files | Recent Image Dust Off settings files (up to four) are listed at the end of the settings menu. Selecting a file from the list sets the controls in Image Dust Off palette to the saved settings. |

### Reusing Image Dust Off Settings

Before pasting or loading Image Dust Off settings into the Image Dust Off palette for another image, be sure that the image was created with the same camera used to record the Image Dust Off reference file. If the reference file was created with a different camera, a warning will be displayed.

### The Settings Menu

The Image Dust Off Settings menu can also be displayed by selecting **Image Dust Off** from the **Settings** menu.



## Vignette Control

The Vignette Control palette is used to correct for loss of marginal lumination, a phenomenon associated with camera lenses that causes a drop in brightness at the edges of a photograph. Vignette Control is most effective when performed on images taken at maximum aperture. If the picture in the active image window is a RAW image taken with a lens equipped to transmit distance information (i.e., a type G or D lens) mounted on a camera that can record this information, Nikon Capture 4 will use the lens information recorded with the image to automatically select an optimal value for Vignette Control. Where lens information is not available, Vignette Control will be based on default lens characteristics. To determine whether a given combination of lens and camera will record distance information, see the table below.

| Camera | Type G or D lens | Other lens |
|---|---|---|
| D2H, D100, D70 | Recorded | Not recorded |
| D1x/D1h (firmware version 1.10 or later) | Recorded | Not recorded |
| D1x/D1h (firmware version 1.01 or earlier) | Not recorded | Not recorded |
| D1 | Not recorded | Not recorded |

To use Vignette Control:

### 1 Display the Vignette Control palette

Select the tool palette containing the Vignette Control palette from the **View** menu (the default location for the Vignette Control palette is Tool Palette 2) and click the triangle at the top left corner of the palette.

### 2 Turn the Apply button on (☑)

Turn the Apply button on (☑) to enable Vignette control.

**Vignette Control**

The controls in the Vignette Control palette are only available if the image in the active window is a RAW (NEF) photograph taken with a D1-series, D2H, D100 or D70 camera. If the image in the active window is JPEG or TIFF, the Apply button in the Vignette Control palette will be grayed out and inactive. Vignette control can not be used to correct vignetting caused by PC Nikkor lenses or Speedlight photography.

**Where Distance Information Is Not Available**

If the photograph in the active window is a RAW image taken with a lens that does not transmit distance information to the camera or with a D1-series camera not equipped to record distance information, Vignette Control will be based on default lens characteristics. Care may be required to prevent overcorrection.

**Neutral.set**

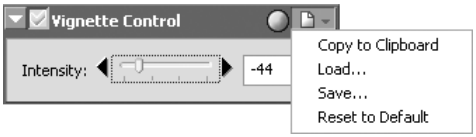
At factory defaults (the default settings stored in the file "Neutral.set"), the Apply button is off (☒) and **Intensity** is set to 80.

## 3 Adjust intensity

Vignette control can be performed manually by dragging the **Intensity** slider or entering a value in the text box to its right. Choose a value between –100 and +200 according to the drop in marginal lumination exhibited by the lens in use. The default value is 80; if 0 is selected, no vignette control will be performed.

### The Vignette Control Settings Menu

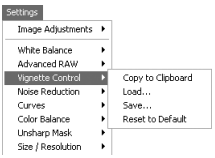
Clicking the icon in the Vignette Control palette displays the Vignette Control Settings menu.




| Option | Description |
|---|---|
| **Copy to Clipboard** | Copy current Vignette Control settings to the clipboard. |
| **Load...** | Select this item to restore settings saved using the **Save...** option (see below). A dialog will be displayed where you can navigate to the drive (volume) and directory containing the desired settings file (only files with the extension ".nvc" will be displayed). The settings in the Vignette Control palette will instantly revert to the saved settings. |
| **Save...** | Select this item to save current settings for the Vignette Control palette to a named file. These settings can later be recalled using the **Load...** option. Choosing **Save...** displays a dialog where you can choose a destination and file name for the current Vignette Control settings. Vignette Control settings are saved with the extension ".nvc". |
| **Reset to Default** | Restores default settings. **Intensity** will be set to 80. |
| Recent files | Recent Vignette Control settings files (up to four) are listed at the end of the settings menu. Selecting a file from the list sets the controls in Vignette Control palette to the saved settings. |

### The Settings Menu

The Vignette Control menu can also be displayed by selecting **Vignette Control** from the **Settings** menu.

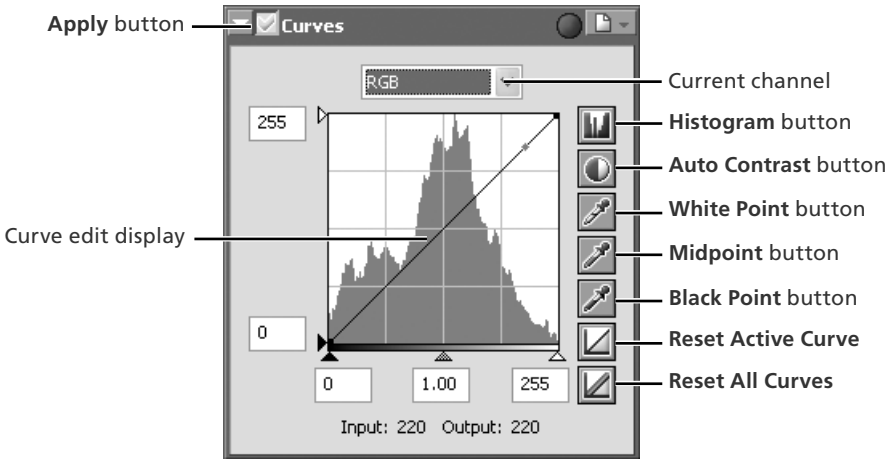


## Curves

Although your Nikon digital camera will reproduce colors accurately if settings have been adjusted appropriately, it will usually be necessary to adjust contrast, tone (brightness) levels, and color balance to make maximum use of the tone range and color gamut offered by a particular output device, such as a printer or monitor. Nikon Capture offers two tools for performing these tasks: the Color Balance palette (see "Color Balance" later in this chapter) and the Curves palette. Of the two, the Curves palette offers the more precise control. The Color Balance palette is useful when, for example, you want to adjust brightness or color balance for all pixels in the image. The Curves palette, in contrast, allows adjustments to be made to specific portions of the tone range, making it possible to enhance the image while preserving detail.

### Curves—an Overview

To view the Curves palette, select the tool palette containing the Curves palette from the **View** menu (the default location for the Curves palette is Tool Palette 1) and click the triangle at the top left corner of the palette. To enable the tools in the Curves palette, turn the Apply button on ( ).




The main editing tool in the Curves palette is the curve edit display, which contains a curve showing the relationship between input (the tones in the original image) and output (how the tones in the input will be represented in the final image). Separate curves control the relationship between input and output for the image as a whole (the "master curve") and for each of the red, green, and blue color components, or "channels." The default curve in each case is linear, meaning that tones will be output exactly as they are input.

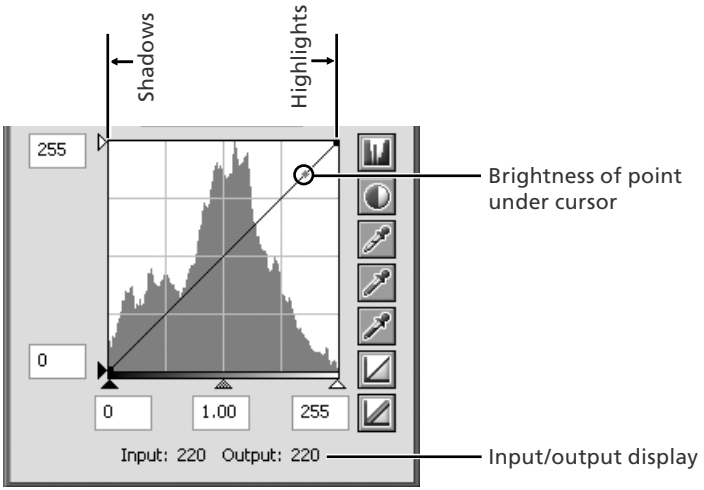
**Opening NEF Files Saved in Nikon Capture 3.5x or Earlier**

In Nikon Capture 4, changes to color balance apply before changes to curves In earlier versions of Nikon Capture, changes to curves applied before changes to color balance, with the result that settings may change when the images saved in Nikon Capture 3.5x or earlier are opened in Nikon Capture 4.

**Preferences > Advanced Color**

Auto contrast, shadow, and highlight settings can be adjusted in the Advanced Color tab of the Preferences dialog.

Input is plotted along the horizontal axis, with shadows (the dark areas of the image) to the left, highlights (the bright areas of the image) to the right, and mid-tones in between. The left end of the axis marks the minimum possible value for colors in the selected channel (zero, or no color), the right end the maximum value. In the case of the master curve, the minimum value represents areas of the input image that are a true black; the maximum value represents areas that are a true white. Output is plotted along the vertical axis, with the minimum possible output value (again, zero, or no color) at the bottom and the maximum output value at the top.



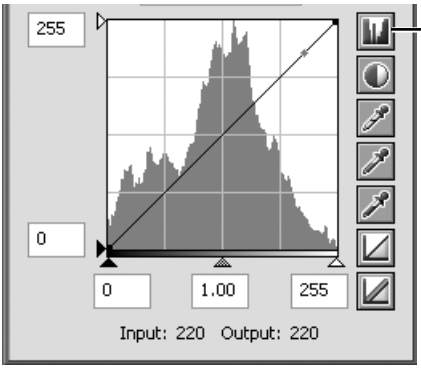

When the cursor is moved over an image or over the curve edit display, the input and output values for the point under the cursor are shown in the input/output display. The input value represents the level of the pixel in the original image, the output value the level of the pixel after any changes to the curve have been applied.

**The Curve Edit Display**

Although values for input and output in the Curves palette range from zero to 255 (eight-bit precision, familiar to users of other image editing software), the results of any changes to curves are calculated at a precision of sixteen bits. This allows twelve-bit RAW data to be modified without lowering the quality of the output.

**Viewing the Histogram**

The first step in adjusting tone levels and color balance in the Curves palette is to view the histogram displayed in the background of the curve edit display. The histogram tells you what tones are present in the original image and in what amounts, information that you will use when setting the black point and white point and editing curves. The histogram takes the form of a bar graph. The horizontal axis gives the tone level, with shadows to the left and highlights to the right. The vertical axis gives the number of pixels of each tone level found in the image, scaled to fit in the curve edit display.




By assigning the darkest tones in the image an output value of zero and the brightest tones in the image an output value of 255, blacks will be output as blacks and whites as whites, making the most effective use of the dynamic range of the output device.

To view the distribution of tones in the final, output image after changes to curves, click and hold the **Histogram** button .

**The Histogram (RAW/16-Bit TIFF Images Only)**

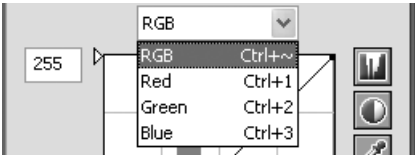
To reduce display times when dealing with large amounts of image data, Nikon Capture 4 may display a histogram containing vertical lines.

**Channel Selection Shortcuts**

The current channel can also be selected using the following shortcuts:

- Ctrl ~ (Windows)/⌘ ~ (Macintosh) Master channel (RGB)
- Ctrl 1 (Windows)/⌘ 1 (Macintosh) Red channel
- Ctrl 2 (Windows)/⌘ 2 (Macintosh) Green channel
- Ctrl 3 (Windows)/⌘ 3 (Macintosh) Blue channel

**Channel Selection**




You can modify tones for all colors in the image using the master curve, or select any of the red, green, and blue curves for editing using the channel menu. The histogram shows tone levels for the selected channel only. When the master curve is selected, the auto-contrast button and white-point and black-point eyedropper tools apply simultaneously to all of the red, green, and blue curves (the master curve is unaffected). When one of the red, green, and blue curves is selected, these controls can be used to edit the selected curve only.

**Setting the White Point and Black Point**

The endpoints of the curve are referred to as the "white point" and the "black point." The black point for a given channel represents the darkest shade (minimum value) for that color, the white point, the brightest shade (maximum value). By default, the input and output values for the black point are zero. The darkest shade in the input image may however be greater than zero, with the result that a portion of the curve is dedicated to reproducing tones not actually present in the image. Increasing the input value for the black point until it matches the darkest shade in the image will steepen the curve, enhancing overall contrast without causing a corresponding loss of detail in shadows. Similarly, if the original image does not actually contain shades corresponding to the maximum value, the white point can be lowered to match the brightest shade in the image.

There are two steps to selecting a white point and black point for the final image: choosing the white-point and black-point input levels, and selecting output levels.

*White-Point and Black-Point Input Levels*

Input levels for the white point and black point can be set using any of the following three methods:

- automatic contrast adjustment
- white-point and black-point sliders
- direct sampling using the white-point and black-point eyedropper tools

Automatic Contrast Adjustment

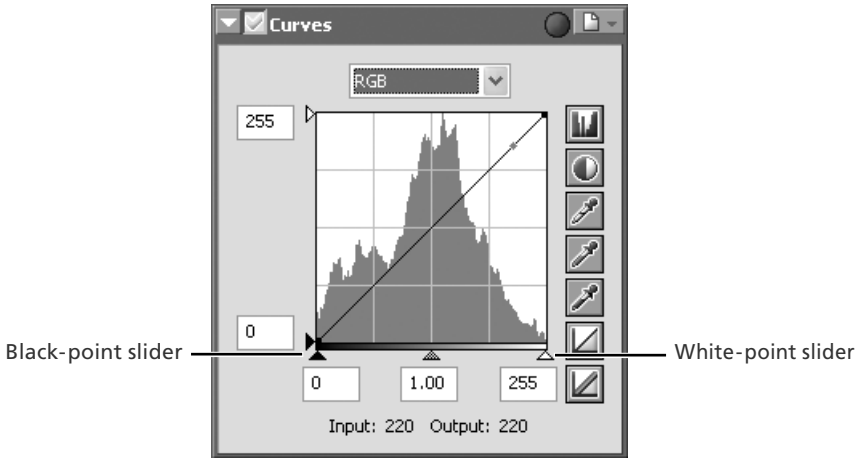
In automatic contrast adjustment, Nikon Capture automatically selects white and black points that exclude a certain percentage of the brightest and darkest pixels in the image, steepening curves for enhanced contrast (the exact percentage of pixels excluded can be specified in the Preferences dialog; 96). By default, 0.5% of the brightest and darkest pixels are excluded, producing a curve that makes optimal use of the output tone range while preserving details in shadows and highlights.

To perform an auto contrast operation, click the **Auto Contrast** button. The white and black points for each of the red, green, and blue channels will be modified simultaneously and the master curve will be displayed in the Curves palette (the master curve itself is unaffected by this operation). Clicking the button with the Ctrl (Windows) or option (Macintosh) key held down adjusts contrast only for the channel currently selected in the channel menu.

### White-Point and Black-Point Sliders

The white-point and black-point sliders can be used to match the white and black points to the histogram displayed in the curve edit display. While these sliders can be used to edit curves for any channel, the best results are usually obtained when they are used to modify the master curve.

To edit the white point or black point, click the corresponding slider once to activate it, then drag it to the right or left (a value can also be entered directly in the text box underneath the slider). Matching the black-point slider with the lowest input value displayed in the histogram will set the minimum output value for the selected channel to the darkest pixel actually present in the image, steepening the curve and enhancing contrast without sacrificing detail in shadows. Similarly, matching the white-point slider with the highest input value displayed in the histogram will set the maximum output value for the selected channel to the brightest pixel present in the image, enhancing contrast without loss of detail in highlights. Any changes are applied instantly to the active image.



### Sampling the Image for White Point or Black Point

The white point or black point can be set by directly sampling the image, allowing you to choose the pixels that will be used to set the maximum (white point) or minimum (black point) output value. This makes it possible to set the black point by matching it to a pixel in the darkest part of the image containing detail you want to preserve, eliminating details in darker areas that are not important to the final image. Similarly, you can match the white point to a pixel in the brightest area of the image containing details important to the final image. While direct sampling can be used with any channel, it is most effective when used with the master curve. When the master curve is selected, sampling will set the white or black point for red, green, and blue curves simultaneously; the master curve itself is unaffected.

To sample the white point, click the **White Point** button . When the cursor is moved over the active image, it will take the shape of an eyedropper. Move the cursor over the image to find the pixel that you want to use to set the white point, keeping an eye on pixel level display in the Information palette to identify pixels with high input values. With the cursor over the target pixel, click the mouse button. The input value for the selected pixel will be used as the input value for the white point. The cursor will return to its original shape, and the image will automatically be altered to reflect the new value for white point.

To sample the image for the black point, click the **Black Point** button and move the eyedropper cursor over the image until you find the point that you want to use to set the minimum input value, then click the mouse button to select the black point.

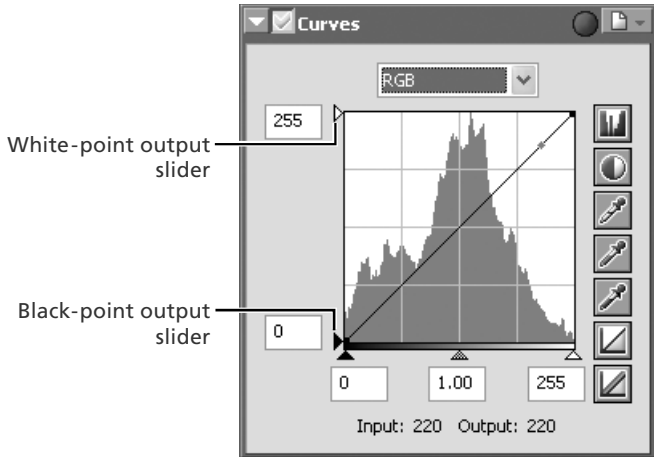
**Setting the White Point or Black Point for the Current Channel**

By default, sampling sets the white point or black point for all channels and displays the master channel. To set the white point, midpoint, or black point for the current channel only, sample the image while holding down the Ctrl key (Windows) or option key (Macintosh) on the keyboard. Note that midpoint can not be sampled for a single channel; regardless of the channel currently selected in the channel menu, sampling the image for midpoint always sets the midpoint for all channels and displays the master channel.

*White Point and Black Point Output Levels*

Once you have set the input level for the black point and white point, output levels can be altered to reflect the actual shade of the darkest and brightest pixels in the image. If the darkest shade in the image represents a true black, for example, the output level for the black point can be left at zero. If, however, darkest shade present in the image is a lighter color, the output level for the black point can be raised to achieve more natural coloration.

The output levels for the white point and black point are set using the white-point and black-point output sliders on the left side of the curve edit display.

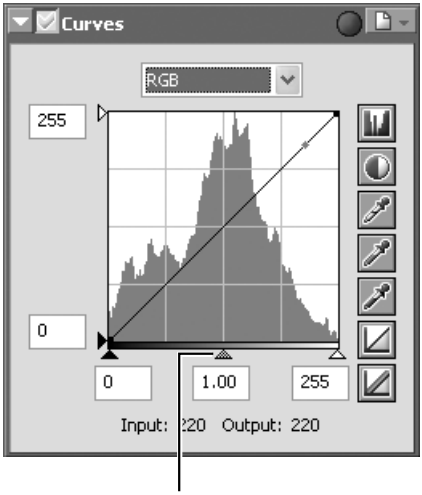



To set the output level, click the slider once to activate it, then drag it up or down until you have found the desired output level (the output level can also be set by entering a value directly in the text box to the left of the slider). The effects of the change will be reflected in the active image.

**Setting the Midpoint**

The point midway between the maximum and minimum input values is known as the "midpoint," which represents a neutral shade corresponding to an output level of 128. The midpoint is controlled by a midpoint slider at the bottom of the curve edit display. Moving the midpoint slider to the left increases the brightness of mid-tones without "washing out" highlights. Moving the slider to the right darkens mid-tones without obliterating detail in shadows.

The midpoint can be set using the midpoint slider or by directly sampling the image using the midpoint eyedropper tool.




*The Midpoint Slider*

The midpoint slider is located at the bottom of the curve edit display.

After clicking the slider once to activate it, move it to the left to increase the brightness of mid-tones in the selected channel, or move it to the right to decrease brightness. Alternatively, you can enter a value for gamma directly in the text box under the slider. The effects of changes to the midpoint can be seen in the active image.

**Gamma**

Gamma (also written "γ") is a fundamental property of video systems which determines the intensity of the output signal relative to the input. When calculating gamma, the maximum possible input intensity is assigned a value of one, and the minimum possible intensity (no input) is assigned a value of zero. Output is calculated by raising input to a power that is the inverse of the gamma value (output = input$^{(1/\gamma)}$). In practical terms, raising the gamma value has the same effect as moving the midpoint slider to the left, raising mid-tone output values and brightening the image while leaving the maximum and minimum values untouched. Lowering the gamma value has the same effect as moving the midpoint slider to the right, lowering mid-tone output values and darkening the image. The default value for gamma is one, which produces a linear curve in which input and output values are the same. Gamma can be set to any value between 0.05 and 6.00.

*Sampling the Image for Midpoint*

The midpoint can also be set by direct sampling. Regardless of the channel currently selected in the channel menu, sampling simultaneously defines the midpoint for each of the red, green, and blue channels while leaving the midpoint for the master curve unchanged.

To sample the midpoint, click the **Midpoint** button . When the cursor is moved over the active image, it will take the shape of an eyedropper. Move the cursor over the image to find the pixel that you want to use to set the midpoint, keeping an eye on the pixel level display in the Information palette to identify pixels with a neutral input value (look for pixels that you think should be a neutral gray color in the final image). With the cursor over the target pixel, click the mouse button. The input value for the selected pixel will be used as the reference value for the midpoint. The cursor will return to its original shape, and the image will automatically be altered to reflect the new value for midpoint.

**Editing Curves Directly**

Fine adjustments can be made to brightness and contrast in specific portions of the tone range by adding additional points to the curves for each channel. These points can be freely adjusted by dragging them into new positions, changing the shape of the curve. Steepening the slope in a given portion of the curve will enhance contrast in that portion of the tone range. Changing the curve so that input levels in a given portion of the tone range are mapped to higher output levels will brighten tones in the affected tone range; similarly, changing the curve to map input levels to lower output levels will darken tones in the affected range.

*Adding New Points to the Curve*

Move the cursor over the curve edit display and click once to enter curve edit mode. Move the cursor to the position where you would like to add a new point, then click. A new point will be added at this position and the curve will automatically be adjusted to pass through this point. The position of the point can be adjusted by dragging it to a new location within the curve edit display. The image in the active window will automatically be adjusted to reflect changes to the curve.

*Removing Points from the Curve*

Points can be removed from the curve by dragging them out of the curve window.

*Resetting the Active Curve to Linear*

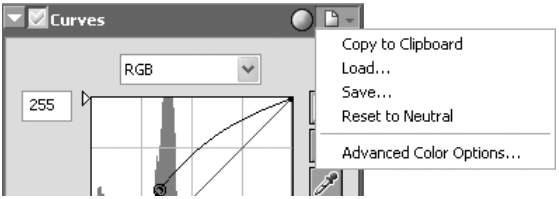
The default linear curve for the current channel can be restored by clicking the  button in the Curves palette.

*Resetting All Curves to Linear*

To reset all curves to linear, click the  button. All curves will be reset and the RGB master channel will be displayed in the Curve palette.

### The Curves Settings Menu

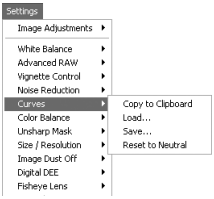
Clicking the button in the Curves palette displays the Curves Settings menu.




| Option | Description |
|---|---|
| **Copy to Clipboard** | Copy current Curves settings to the clipboard. |
| **Load...** | Select this item to load curves previously saved using the **Save...** option (see below). A dialog will be displayed where you can navigate to the drive (volume) and directory containing the desired settings file (only files with the extension ".ncv" will be displayed). The settings in the Curves palette will instantly revert to the saved settings. |
| **Save...** | Select this item to save curves for all channels to a named file. These settings can later be recalled using the **Load...** option. Choosing **Save...** displays a dialog where you can choose a destination and file name for the current curves. Curves are saved with the extension ".ncv". |
| **Reset to Neutral** | Reset all curves to linear. |
| Recent files | Recent Curves settings files (up to four) are listed at the end of the settings menu. Selecting a file from the list sets the controls in Curves palette to the saved settings. |
| **Advanced Color Options...** | Open the Nikon Capture 4 Editor Preferences dialog to the Advanced Color tab (96). |

### The Settings Menu

The Curves Settings menu can also be displayed by selecting **Curves** from the **Settings** menu.

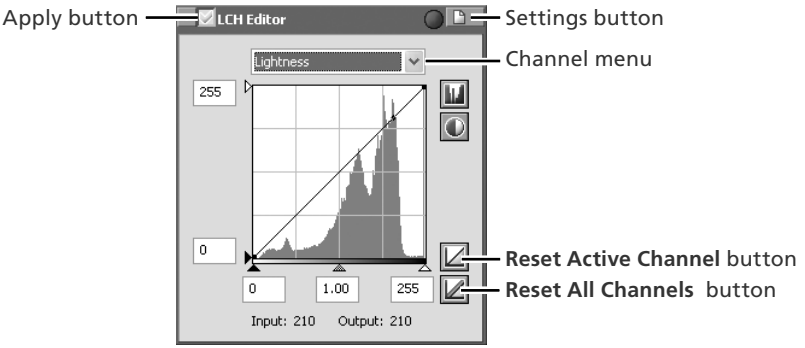


## The LCH Editor

The LCH Editor models color using three channels: **L**ightness (brightness), **C**hroma (color saturation, or vividness), and **H**ue. To use the LCH Editor:

### 1 Display the LCH Editor

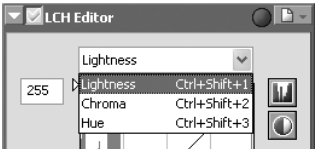
Select the tool palette containing the LCH Editor from the **View** menu (the default location for the LCH Editor is Tool Palette 2) and click the triangle at its top left corner.




### 2 If the Apply button is off ( ) , turn it on ( )

### 3 Select a channel

Select the desired channel from the channel menu.




### 4 Adjust settings

Adjust settings for the selected channel as described on the following pages.

**Channel Selection Shortcuts**

The channel can also be selected using the following shortcuts:

- Ctrl Shift 1 (Windows)/⌘ option 1 (Macintosh): lightness channel
- Ctrl Shift 2 (Windows)/⌘ option 2 (Macintosh): chroma channel
- Ctrl Shift 3 (Windows)/⌘ option 3 (Macintosh): hue channel

**Input and Output (Intensity) Displays**

When the cursor is moved over an image or over the edit window in the LCH Editor, input and output levels for the pixel under the cursor are shown on the curve and in the input and output displays for the current channel.

**The "Reset Active Channel" and "Reset All Channels" Buttons**

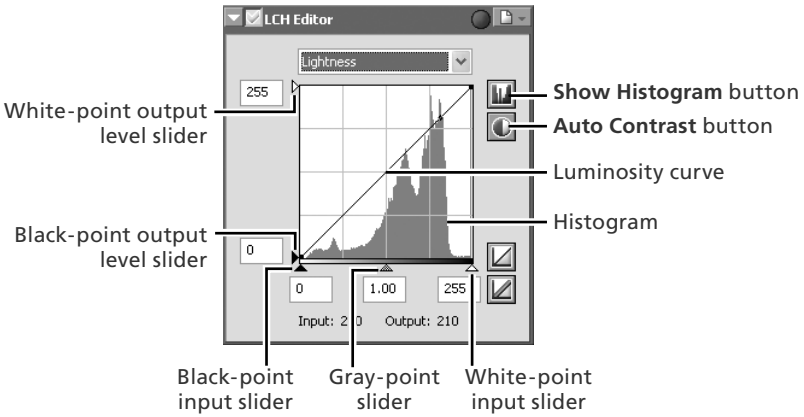
Click the Reset Active Channel button to reset the active curve to linear. Click the Reset All Channels button to reset all curves in the LCH Editor to linear.

**Preferences > Advanced Color**

Auto contrast, shadow, and highlight settings can be adjusted in the Advanced Color tab of the Preferences dialog.

**The Lightness Channel**

Although it affects brightness rather than color, editing luminosity has a similar effect to editing the master curve in the Curves palette.




*Luminosity curve*

Maps luminosity in the original image (input) to the luminosity of the image after editing (output). Any portion of the curve can be edited as described in "Curves" (44); steepening the curve increases the difference between light and dark areas of the image, increasing contrast.

*Histogram*

Shows the distribution of pixels of different luminosities in the input. The horizontal axis corresponds to luminosity (in the range 0–255), the vertical axis to the number of pixels.

*Output level sliders*

Choose the maximum (white point) and minimum (black point) values for output.

*Input level sliders*

Choose the maximum (white point) and minimum (black point) input levels.

*Gray-point slider*

Set the gray point (gamma value). Moving the gray point alters the brightness of mid-tones while preserving detail in highlights and shadows.

*Show Histogram button*

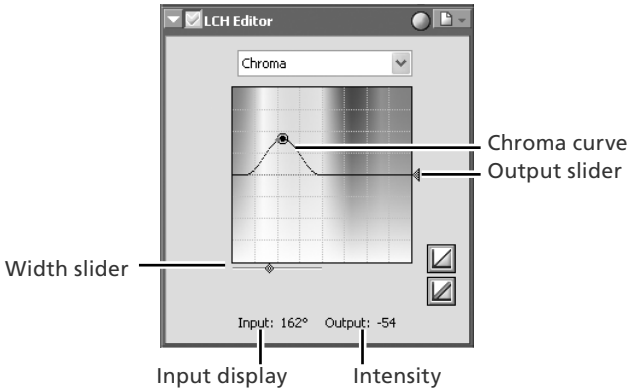
Click to view the luminosity distribution for the final image. Click again to view the input luminosity distribution.

*Auto Contrast button*

Set the maximum and minimum input levels to exclude values for 0.5% of the brightest and darkest pixels in the crop. The percentage of pixels excluded can be adjusted in the Advanced Color tab in the Preferences dialog.

**The Chroma Channel**

The Chroma editor is useful tool for adjusting color saturation.




*Chroma curve*

Maps chroma in the original image (input) to the chroma of the image after editing (output). Moving a point on the curve upward makes colors in the affected portion of the color range more vivid, while moving it downward makes the affected colors less vivid, or grayer.

*Width slider*

Adjust the width of the curve that passes through the selected point, increasing or decreasing the range of colors affected by the change.

*Output slider*

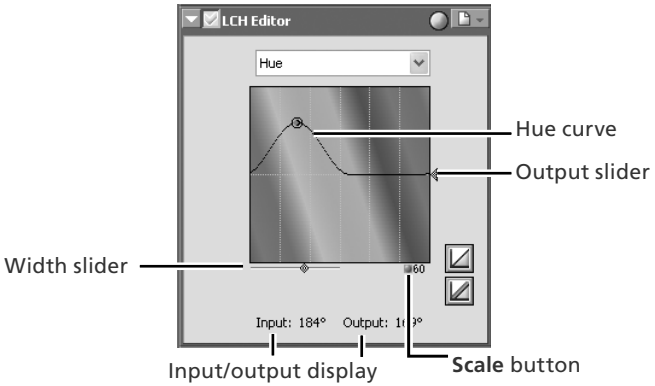
Moving the slider affects the saturation of all colors in the image.

*Intensity*

The amount by which the saturation of the selected point will be increased or decreased in the output image.

**The Hue Channel**

The hue editor is used to map selected colors in the original (input) image to a specific range of colors in the final (output) image. This can be used, for example, to make all reds in the image slightly more orange, or even green or blue.




*Hue curve*

Maps hue in the original image (input) to the hue of the image after editing (output). Select a point on the curve that corresponds to the desired input color and drag it up and down until it intersects with the desired output color.

*Width slider*

Adjust the width of the curve that passes through the selected point, increasing or decreasing the range of hues affected by the change.

*Output slider*

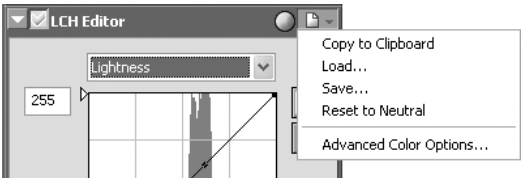
Moving the slider affects the hue of all colors in the image.

*Scale button*

Click to change the vertical scale from 60° through 120° to 180° and back again (the degrees in this scale refer to 360° color wheel). Increasing the scale increases the range of hues visible in the display, while decreasing the scale increases precision.

### The LCH Editor Settings Menu

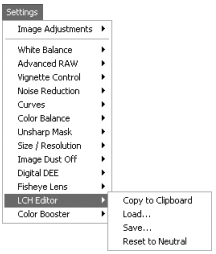
Clicking the triangle in the top right corner of the LCH Editor displays the LCH Editor settings menu.




| Option | Description |
|---|---|
| **Copy to Clipboard** | Copy current LCH Editor settings to the clipboard. |
| **Load...** | Select this item to load settings previously saved using the **Save...** option (see below). A dialog will be displayed where you can navigate to the drive (volume) and directory containing the desired settings file (only files with the extension ".nlv" will be displayed). The settings in the LCH Editor will instantly revert to the saved settings. |
| **Save...** | Select this item to save settings for all channels to a named file. These settings can later be recalled using the **Load...** option. Choosing **Save...** displays a dialog where you can choose a destination and file name for the current LCH Editor settings. LCH Editor settings are saved with the extension ".nlv". |
| **Reset to Neutral** | Reset all curves to linear. |
| Recent files | Recent LCH Editor settings files (up to four) are listed at the end of the settings menu. Selecting a file from the list sets the controls in LCH Editor to the saved settings. |
| **Advanced Color Options...** | Open the Nikon Capture 4 Editor Preferences dialog to the Advanced Color tab (96). |

### The Settings Menu

The LCH Editor Settings menu can also be displayed by selecting **LCH Editor** from the **Settings** menu.



## Color Booster

The Color Booster is used to enhance overall color saturation (vividness) according to the type of subject (portrait or landscape).

1 Display the Color Booster palette

Select the tool palette containing the Color Booster from the **View** menu (the default location for the Color Booster palette is Tool Palette 1) and click the triangle at the top left corner of the palette.

2 If the Apply button is off ( ) , turn it on ( )

3 Adjust settings

Target Type

Select **People** to adjust saturation without affecting skin tones, **Nature** to adjust saturation for all colors in the image.

Level

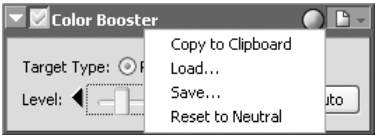
Use the slider to adjust saturation, or a enter a value between 0 and 100 in the text box to its right.

Auto

Optimize saturation to suit the selected subject type.

### The Color Booster Settings Menu

Clicking the triangle in the top right corner of the Color Booster palette displays the Color Booster settings menu.




| Option | Description |
|---|---|
| **Copy to Clipboard** | Copy current Color Booster settings to the clipboard. |
| **Load...** | Select this item to load settings previously saved using the **Save...** option (see below). A dialog will be displayed where you can navigate to the drive (volume) and directory containing the desired settings file (only files with the extension ".ncb" will be displayed). The settings in the Color Booster palette will instantly revert to the saved settings. |
| **Save...** | Select this item to save settings for all channels to a named file. These settings can later be recalled using the **Load...** option. Choosing **Save...** displays a dialog where you can choose a destination and file name for current Color Booster settings. Color Booster settings are saved with the extension ".ncb". |
| **Reset to Neutral** | Reset Color Booster settings to default values. |
| Recent files | Recent Color Booster settings files (up to four) are listed at the end of the settings menu. Selecting a file from the list sets the controls in Color Booster palette to the saved settings. |

### The Settings Menu

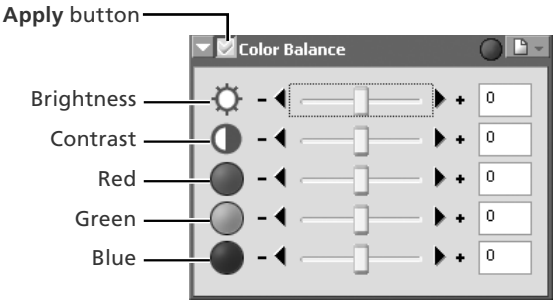
The Color Booster Settings menu can also be displayed by selecting **Color Booster** from the **Settings** menu.

## Color Balance

The Color Balance palette offers simple controls for adjusting overall brightness, contrast, and color balance for the entire image. Unlike the controls in the Curves palette, however, the Color Balance palette does not allow you to make changes that affect only a portion of the tone range. After making broad adjustments to color balance in the Color Balance palette, examine the histogram in the Curves palette and make fine adjustments as needed.

### Adjusting Brightness, Contrast, and Color Balance

1 Display the Color Balance palette
Select the tool palette containing the Color Balance palette from the **View** menu (the default location for the Color Balance palette is Tool Palette 1) and click the triangle at the top left corner of the palette.




2 If the Apply button is off (☒) , turn it on (☑)

**Opening NEF Files Saved in Nikon Capture 3.5x or Earlier**

In Nikon Capture 4, changes to color balance apply before changes to curves. In earlier versions of Nikon Capture, changes to curves applied before changes to color balance, with the result that settings may change when the images saved in Nikon Capture 3.5x or earlier are opened in Nikon Capture 4.

**Nikon Capture 3 or Earlier**

A value of +50 in Nikon Capture 3.5 or earlier corresponds to a value of +100 in Nikon Capture 4.

## 3 Adjust brightness, contrast, and color balance

Adjust brightness, contrast, and color balance using the options in the Color Balance palette.

*Adjusting Overall Brightness*

The brightness slider adjusts brightness for the entire image. Dragging the brightness slider in the + direction brightens all the colors in the image, making the image as a whole more white. Dragging the slider in the – direction darkens all the colors in the image, making the image as a whole darker and less distinct. Unlike adjustments to the midpoint in the Curves palette, this setting applies equally to shadows and highlights, producing a flat, low-contrast image. A value for brightness between –100 and +100 can be entered directly in the text box to the right of the slider.

*Adjusting Image Contrast*

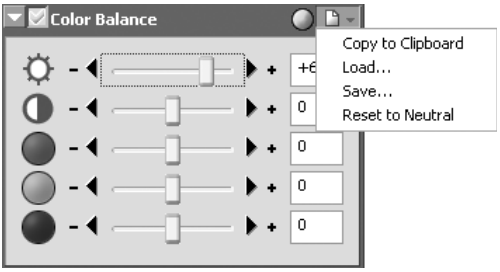
Dragging the contrast slider in the + direction heightens the difference between highlights and shadows in the image, increasing contrast. Dragging the slider in the – direction decreases the difference between light and dark portions of the image, lowering contrast. A value for contrast between –100 and +100 can be entered in the text box to the right of the slider.

*Adjusting Color Balance*

While the brightness slider adjusts brightness for the image as a whole, the three color-balance controls allow the user to adjust brightness for each color individually. For example, dragging the red slider in the + direction brightens the red portions of the image, making the image as a whole more red. Dragging it in the – direction dims the red elements in the image, bringing out the remaining colors. A value between –100 and +100 can be entered for each color in the text box to the right of the slider.

### The Color Balance Settings Menu

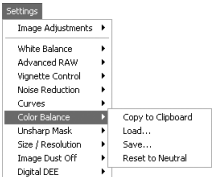
Clicking the button in the Color Balance palette displays the Color Balance Settings menu.




| Option | Description |
|---|---|
| **Copy to Clipboard** | Copy current Color Balance settings to the clipboard. |
| **Load...** | Select this item to load brightness, contrast, and color balance settings previously saved using the **Save...** option (see below). A dialog will be displayed where you can navigate to the drive (volume) and directory containing the desired settings file (only files with the extension ".nca" will be displayed). The settings in the Color Balance palette will instantly revert to the saved settings. |
| **Save...** | Select this item to save brightness, contrast, and color balance settings to a named file. These settings can later be recalled using the **Load...** option. Choosing **Save...** displays a dialog where you can choose a destination and file name for the current Color Balance settings. Color Balance settings are saved with the extension ".nca". |
| **Reset to Neutral** | Resets all brightness, contrast, and color balance settings to zero. |
| Recent files | Recent Color Balance settings files (up to four) are listed at the end of the settings menu. Selecting a file from the list sets the controls in Color Balance palette to the saved settings. |

### The Settings Menu

The Color Balance Settings menu can also be displayed by selecting **Color Balance** from the **Settings** menu.



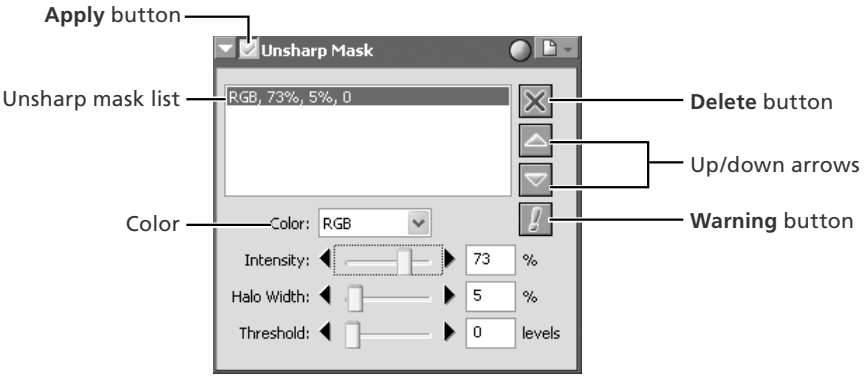
## Unsharp Mask

Using Unsharp Mask, the user can increase the sharpness of photographs by making edges more distinct. Unsharp Mask works by increasing the contrast of the edges in the image while leaving other areas untouched. The amount of sharpness is determined by three factors: intensity, halo width, and threshold.

### Creating Unsharp Masks

1 Display the Unsharp Mask palette

Select the tool palette containing the Unsharp Mask palette from the **View** menu (the default location for the Unsharp Mask palette is Tool Palette 1) and click the triangle at the top left corner of the palette.




2 If the Apply button is off ( ☐ ) , turn it on ( ☑ )

**The Warning Button**

A warning button appears if the image in the active window is displayed at a zoom ratio too low to allow the effects of Unsharp Mask to be displayed. Click the button to view the warning.

## 3 Create an Unsharp Mask

Unsharp Mask can be applied to all the colors in the image or selectively to any combination of red, green, and blue channels. Select a combination of colors from the Color pop-up menu. The Unsharp Mask you create will be applied only to edges in the selected colors.

## 4 Select values for intensity, halo width, and threshold

### Intensity

The amount the contrast of edges will be increased. Too great an intensity will degrade your image rather than sharpening it.

### Halo Width

The size of the areas that will be affected. The greater the halo width, the wider the edges in the sharpened image will appear. Too large a value for halo width will produce a "halo" along edges in the image.

### Threshold

The limit at which sharpening will be applied. If the threshold is zero, sharpening will apply to all pixels in the image. Increasing the threshold increases the amount of contrast that must be present between pixels before Unsharp Mask will be applied, with the result that only more distinctly contrasting edges will be affected.

## 5 Create additional masks

The controls in the Unsharp Mask palette allow you to select multiple combinations of colors that can be sharpened to different degrees. Repeat steps 1–4 to create additional masks for different color combinations. As new masks are created, they will be added to the end of the Unsharp Mask list. Masks apply in the order listed. To change the order in which masks apply, select a mask in the Unsharp Mask list and click the up arrow to move it up in the list, or the down arrow to move it down. To delete an Unsharp Mask from the list, select it and click the **Delete** button.

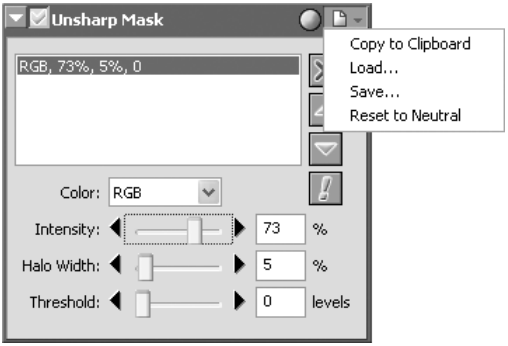
**Unsharp Mask**

Unsharp Mask sharpens edges without affecting color balance by making adjustments only to luminosity (brightness). The effect is the same as performing Unsharp Mask with the Luminosity channel selected in the Adobe Photoshop Lab color model. If Unsharp Mask is applied to a single channel, such as red, the values for ab (chrominance) are used to determine what points in the image are red, and Unsharp Masking applied to the Luminosity channel for those points only. An intensity of around 20% in Nikon Capture 4 is roughly equivalent to 100% in Adobe Photoshop.

No sharpening will be applied if Intensity is set to zero. Intensity must be set to at least 1% if sharpening is to apply.

### The Unsharp Mask Settings Menu

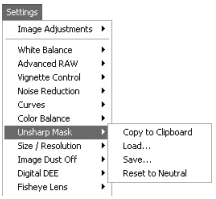
Clicking the button in the Unsharp Mask palette displays the Unsharp Mask Settings menu.




| Option | Description |
|---|---|
| **Copy to Clipboard** | Copy current Unsharp Mask settings to the clipboard. |
| **Load...** | Select this item to load Unsharp Masks previously saved using the **Save...** option (see below). A dialog will be displayed where you can navigate to the drive (volume) and directory containing the desired settings file (only files with the extension ".num" will be displayed). The settings in the Unsharp Mask palette will instantly revert to the saved settings. |
| **Save...** | Select this item to save Unsharp Mask settings to a named file. These settings can later be recalled using the **Load...** option. Choosing **Save...** displays a dialog where you can choose a destination and file name for the current Unsharp Mask settings. Unsharp Mask settings are saved with the extension ".num". |
| **Reset to Neutral** | Deletes all Unsharp Masks currently displayed in the Unsharp Mask palette. |
| Recent files | Recent Unsharp Mask settings files (up to four) are listed at the end of the settings menu. Selecting a file from the list sets the controls in Unsharp Mask palette to the saved settings. |

### The Settings Menu

The Unsharp Mask Settings menu can also be displayed by selecting **Unsharp Mask** from the **Settings** menu.



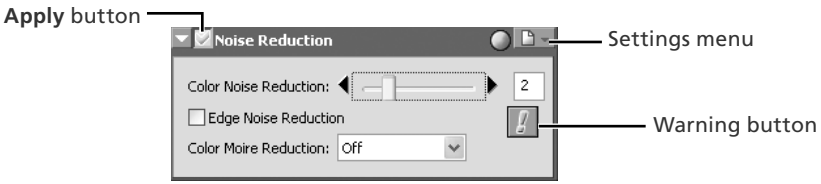
## Noise Reduction

This palette can be use to mitigate the effects of noise that sometimes appears in images taken with digital cameras.

### Reducing Noise

1 Display the Noise Reduction palette

Select the tool palette containing the Noise Reduction palette from the **View** menu (the default location for the Noise Reduction palette is Tool Palette 2) and click the triangle at the top left corner of the palette.




2 If the Apply button is off ( ) , turn it on ( )

3 Adjust noise reduction options

Color Noise Reduction

To reduce noise (a mottling phenomenon that occurs principally in photographs taken at high sensitivities), drag the slider to select a value from 0 (no noise reduction performed) to 10 (maximum noise reduction).

Edge Noise Reduction

Check this box to reduce noise along edges in the photo, making outlines more distinct.

Color Moiré Reduction (RAW images only)

Color moiré (color interference caused by regular overlapping patterns) can be reduced using this option. Choose the amount of compensation performed from **Off**, **Low**, **Medium**, or **High**.

4 View the results

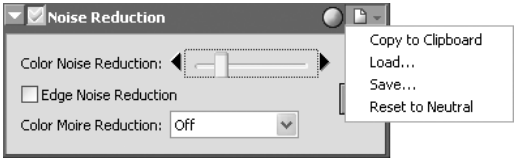
Confirm the effects of noise reduction on the entire image and adjust settings as necessary.

**The Warning Button**

Color noise reduction will not be performed when the warning button is displayed. Zoom the image in until the warning button is no longer displayed.

### The Noise Reduction Settings Menu

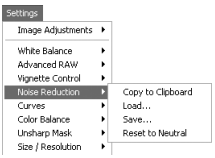
Clicking the button in the Noise Reduction palette displays the Noise Reduction Settings menu.




| Option | Description |
|---|---|
| **Copy to Clipboard** | Copy current Noise Reduction settings to the clipboard. |
| **Load...** | Select this item to load Noise Reduction settings previously saved using the **Save...** option (see below). A dialog will be displayed where you can navigate to the drive (volume) and directory containing the desired settings file (only files with the extension ".nnr" will be displayed). The settings in the Noise Reduction palette will instantly revert to the saved settings. |
| **Save...** | Select this item to save Noise Reduction settings to a named file. These settings can later be recalled using the **Load...** option. Choosing **Save...** displays a dialog where you can choose a destination and file name for the current Noise Reduction settings. Noise Reduction settings are saved with the extension ".nnr". |
| **Reset to Neutral** | Resets Noise Reduction settings to their default values. |
| Recent files | Recent Noise Reduction settings files (up to four) are listed at the end of the settings menu. Selecting a file from the list sets the controls in Noise Reduction palette to the saved settings. |

### The Settings Menu

The Noise Reduction Settings menu can also be displayed by selecting **Noise Reduction** from the **Settings** menu.



## Digital DEE

Digital DEE (**D**ynamic **E**xposure **E**xtender) reveals details in shadows and highlights, correcting for underexposure in back-lit subjects or shaded areas of images and for overexposure in brightly lit areas.

### 1 Display the Digital DEE palette

Select the tool palette containing the Digital DEE palette from the **View** menu (the default location for the Digital DEE palette is Tool Palette 1) and click the triangle at the top left corner of the palette.

### 2 Turn the Apply button on (☑)

Turn the Apply button on (☑) to enable Digital DEE.

### 3 Adjust settings

*Enhancing Details in Shadows*

To enhance details in shadows, adjust shadow brightness using the **Shadow adjustment** slider or by entering a value between 1 and 100 in the text box to its right. The larger the value, the brighter shadows in the image will be. The default setting is 20.

The effects of changes to shadow brightness will be visible in the image in the active window (some time may be required for the image to be updated). Adjust settings until the desired results are achieved.

**Digital DEE**

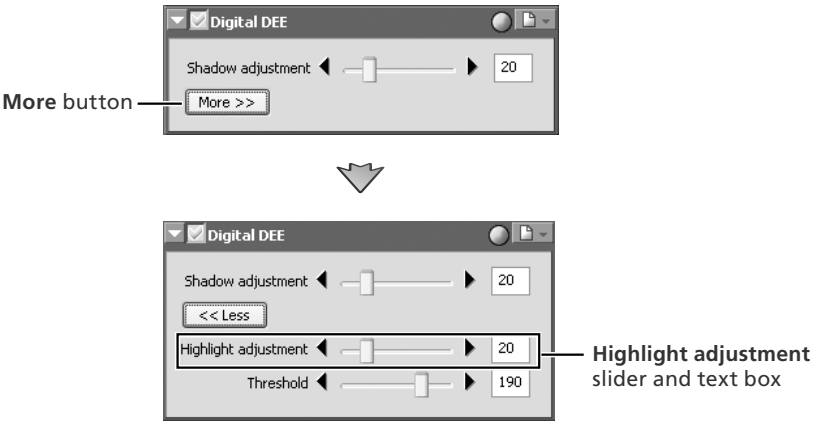
Digital DEE is available only with images created using the Nikon digital cameras supported under Nikon Capture 4 (D1, D1x, D1H, D2H, D100, D70, and COOLPIX cameras, with the exceptions of the E100, E300, and E600). Images must be in their original file formats.

**Monotone Shadows**

Shadow adjustment has no effect if details in shadows have been totally obliterated, leaving shadows a single, uniform color.

*Enhancing Details in Highlights*

Digital DEE can also be used to reveal details in highlights where the background is much brighter than the subject or the subject much brighter than the background. To enhance details in highlights, click **More**.




Adjust highlights using the **Highlight adjustment** slider or by entering a value between 1 and 100 in the text box to its right. Increasing highlight adjustment increases contrast in highlights, while decreasing highlight adjustment has the opposite effect. The default value is 20.

The effects of changes to highlights will be visible in the image in the active window (some time may be required for the image to be updated). Adjust settings until the desired results are achieved.

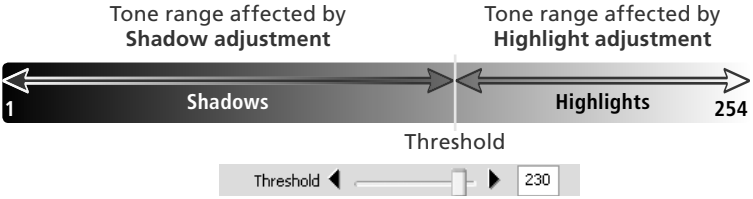
**Monotone Highlights**

Highlight adjustment has no effect if details in highlights have been totally obliterated, leaving highlights a single, uniform color.

*Defining "Shadows" and "Highlights"*

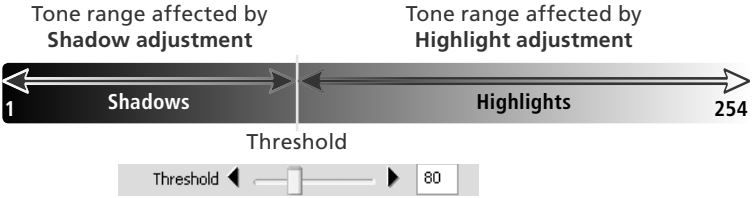
The **Threshold** slider in the detailed view of the "Digital DEE" panel determines the border between shadows and highlights.

Moving the slider to the right or entering a higher value in the **Threshold** text box increases the range of tones affected by the **Shadow adjustment** slider and reduces the range of tones affected by the **Highlight adjustment** slider.




Try increasing the threshold value if shadow brightness fails to brighten shadows in the desired tone range, or if highlight adjustment is affecting too great an area.

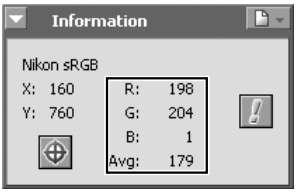
Moving the slider to the left or entering a lower value in the **Threshold** text box increases the range of tones affected by the **Highlight Adjustment** slider and reduces the range of tones affected by the **Shadow Adjustment** slider.




Try decreasing the threshold value if highlight adjustment fails to increase contrast in the desired tone range, or if shadow brightness is affecting too great an area.

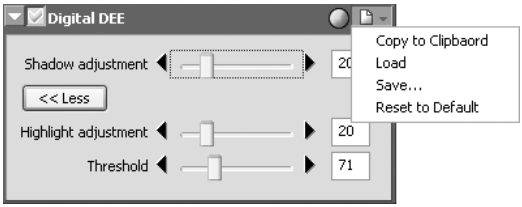
**Threshold**

Ideally, the threshold for shadow adjustment should be twenty to forty greater than the highest of the R and G values in the brightest shadows. The threshold for highlight adjustment should be twenty to forty less than lowest of the R and G values in the darkest highlights. To choose a threshold that can be used for both shadows and highlights, enter the average of the highest value (R or G) in the brightest shadows and the lowest value (R or G) in the darkest highlights. Color values can be determined by moving the cursor over the image and observing the R and G values in the Information palette.



## The Digital DEE Settings Menu

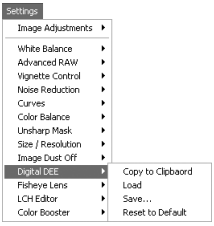
Clicking the button in the Digital DEE palette displays the Digital DEE Settings menu.




| Option | Description |
|---|---|
| **Copy to Clipboard** | Copy current Digital DEE settings to the clipboard. |
| **Load...** | Select this item to load Digital DEE settings previously saved using the **Save...** option (see below). A dialog will be displayed where you can navigate to the drive (volume) and directory containing the desired settings file (only files with the extension ".ndd" will be displayed). The settings in the Digital DEE palette will instantly revert to the saved settings. |
| **Save...** | Select this item to save Digital DEE settings to a named file. These settings can later be recalled using the **Load...** option. Choosing **Save...** displays a dialog where you can choose a destination and file name for the current Digital DEE settings. Digital DEE settings are saved with the extension ".ndd". |
| **Reset to Default** | Reset Digital DEE settings to default values. |
| Recent files | Recent Digital DEE settings files (up to four) are listed at the end of the settings menu. Selecting a file from the list sets the controls in Digital DEE palette to the saved settings. |

### The Settings Menu

The Digital DEE Settings menu can also be displayed by selecting **Digital DEE** from the **Settings** menu.



## **Fisheye Lens** *(Fisheye-to-Rectilinear Transform for DX 10.5 mm Fisheye Lenses)*

The tools in the Fisheye Lens palette modify images taken with an AF DX 10.5 mm f2.8G Nikkor fisheye lens to resemble images taken with a normal wide-angle lens. This option is not available with other lenses.

### 1 Display the Fisheye Lens palette

Select the tool palette containing the Fisheye Lens palette from the **View** menu (the default location for the Fisheye Lens palette is Tool Palette 2) and click the triangle at the top left corner of the palette.

### 2 Turn the Apply button on (☑)

Turn the Apply button on (☑) to enable the Fisheye Lens. The image in the active window will be trimmed around a vertical area in the center of the image that has been processed to compensate for fisheye distortion, and the **Include areas where there is no image data** check box will be enabled.

### 3 Adjust settings

#### Include areas where there is no image data

Check this option to trim the image in the active area around a horizontal area in the center of the image that has been processed to compensate for fisheye distortion and fill areas where there are no image data with the color selected in the **Fill color** menu.

Image created with supported fisheye lens

Apply button on (vertical compensation)

**Include areas where there is no image data** selected (horizontal compensation)

Areas without image data filled in white, light gray, dark gray, black, red, green, blue, cyan, magenta, or yellow

### The Fisheye Lens Settings Menu

Clicking the button in the Fisheye Lens palette displays the Fisheye Lens Settings menu.

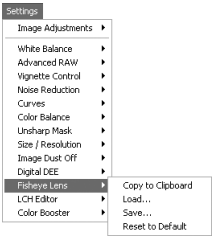
| Option | Description |
|---|---|
| **Copy to Clipboard** | Copy current Fisheye Lens settings to the clipboard. |
| **Load...** | Select this item to load Fisheye Lens settings previously saved using the **Save...** option (see below). A dialog will be displayed where you can navigate to the drive (volume) and directory containing the desired settings file (only files with the extension ".nfe" will be displayed). The settings in the Fisheye Lens palette will instantly revert to the saved settings. |
| **Save...** | Select this item to save Fisheye Lens settings to a named file. These settings can later be recalled using the **Load...** option. Choosing **Save...** displays a dialog where you can choose a destination and file name for the current Fisheye Lens settings. Fisheye Lens settings are saved with the extension ".nfe". |
| **Reset to Default** | Reset Fisheye Lens settings to default values. |
| Recent files | Recent Fisheye Lens settings files (up to four) are listed at the end of the settings menu. Selecting a file from the list sets the controls in Fisheye Lens palette to the saved settings. |

### Vertical Compensation

Because the edges are trimmed when vertical compensation is in effect, images saved with the Apply button checked have a smaller file size than the originals.

### The Settings Menu

The Fisheye Lens Settings menu can also be displayed by selecting **Fisheye Lens** from the **Settings** menu.



## Output Size and Resolution

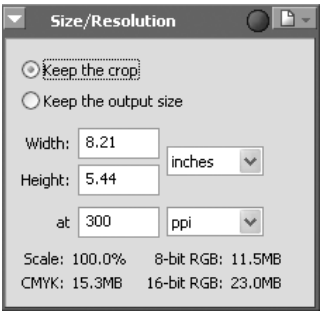
The Size/Resolution palette is where you specify the final ("output") size of the portion of the image that will be saved when **Save** or **Save as…** is selected from the **File** menu. The choice of settings in the Size/Resolution palette depends on how you intend to use the image and the amount of storage space you have available. Some examples are given below.

*If the image will be used in printing or desktop publishing…*
…size and resolution will be dictated by the resolution of the output device and the physical size of the image when printed, measured in centimeters or points rather than pixels.

*If you intend to use the image on a web page…*
…specify output size in pixels, keeping file size to a minimum for rapid downloads. Resolution in this case is not an issue.

### Adjusting Size and Resolution

1 Display the Size/Resolution palette
Select the tool palette containing the Size/Resolution palette from the **View** menu (the default location for the Size/Resolution palette is Tool Palette 1) and click the triangle at the top left corner of the palette.




**RAW Image Size (D1x Only)**
The D1x is designed to record images at 3,008 × 1,960 pixels (six megapixels). Image quality will not necessarily increase when RAW images are output at a size of 4,016 × 2,616 pixels (ten megapixels, equivalent to the dimensions of the CCD).

**NEF Images**
When an image is saved in NEF format, the entire image will be saved together with information on resolution and the size and dimensions of the current crop.

2 Make changes to options as described below

Keep the crop

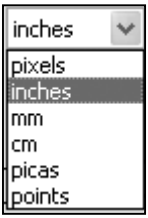
When **Keep the crop** is selected, you can use the mouse to adjust the size and position of the current crop as desired. If you enter a new value for height or width in the Size/Resolution palette, the remaining dimension changes automatically to maintain a constant height-width aspect ratio, and scale is adjusted to reflect the new dimensions (scale can not be increased beyond 200%). If the image can not be output at the current resolution using the new dimensions, resolution will automatically be adjusted to an appropriate value. This option is useful when you want to specify height and width after selecting a crop.

Keep the output size

**Keep the output size** locks output dimensions and file size at their current values, setting the aspect ratio of the current crop according to the dimensions input in the Size/Resolution palette. This height-width aspect ratio will be maintained when you adjust the size of the crop in the active window, and scale will be adjusted to reflect changes to the size of the crop (scale can not be increased beyond 200%). If the image can not be output at the current resolution using the new dimensions, resolution will automatically be adjusted to an appropriate value. This option is useful when you want to set the output dimensions and file size of the final image before selecting a crop.

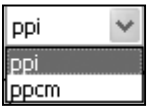
Width/Height

The output dimensions for the current crop can be entered in these text boxes. The units used to describe output dimensions can be chosen from the menu to the right of the text boxes.




at

The **at** text box is where you enter the output resolution. This text box is not active if the unit chosen for output size is "pixels," when resolution is fixed at 300 ppi. The value chosen at other settings should reflect the resolution of the output device on which the final image is to be printed. The units for resolution can be selected from the resolution menu, which offers a choice of pixels per inch (ppi) or pixels per centimeter (ppcm). The default resolution is 300 ppi.

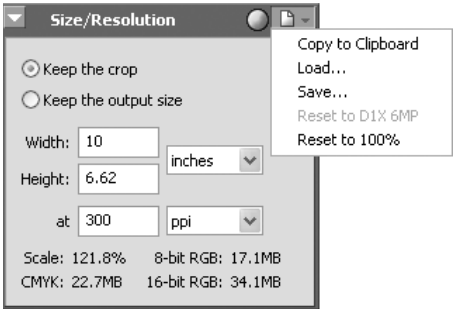



**Scale/File Size**

Scale (output size as a percentage of input size, maximum 200%) is displayed at the bottom of the Size/Resolution palette, together with the uncompressed file size of the image that would be created at current settings. File size depends on the color model (RGB or CMYK) and, in the case of RGB images, on the pixel bit-depth that will be used when the image is saved. Separate uncompressed file sizes are shown for CMYK and for eight-bit and sixteen-bit RGB.

### The Size/Resolution Settings Menu

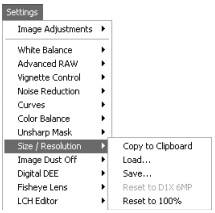
Clicking the button in the Size/Resolution palette displays the Size/Resolution Settings menu.




| Option | Description |
|---|---|
| **Copy to Clipboard** | Copy current Size/Resolution settings to the clipboard. |
| **Load...** | Select this item to load size and resolution settings previously saved using the **Save...** option (see below). A dialog will be displayed where you can navigate to the drive (volume) and directory containing the desired settings file (only files with the extension ".nsr" will be displayed). The settings in the Size/Resolution palette will instantly revert to the saved settings. |
| **Save...** | Select this item to save size and resolution settings to a named file. These settings can later be recalled using the **Load...** option. Choosing **Save...** displays a dialog where you can choose a destination and file name for the current size and resolution settings. Size and resolution settings are saved with the extension ".nsr". |
| **Reset to D1X 6MP** | Reduces RAW images created with the D1x by 74.9% to 3,008 × 1,960 pixels (six megapixels). Select **Reset to 100%** to restore the image to 4,016×2,616 pixels. This option is only available with RAW images taken using the D1x. |
| **Reset to 100%** | Enlarges the crop to include the entire image. Resolution will be reset to the default value of 300 ppi (118.11 ppcm). |
| Recent files | Recent Size/Resolution settings files (up to four) are listed at the end of the settings menu. Selecting a file from the list sets the controls in Size/Resolution palette to the saved settings. |

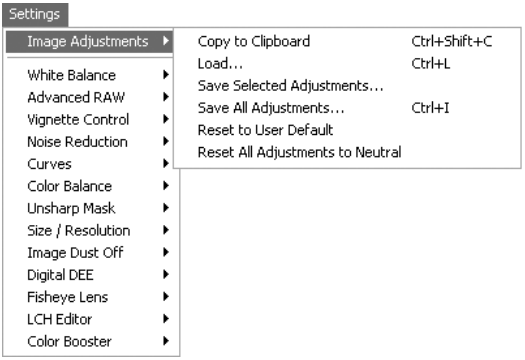
### The Settings Menu

The **Size/Resolution** Settings menu can also be displayed by selecting **Size/Resolution** from the **Settings** menu.



## Saving and Loading Image Adjustment Settings

Image adjustment settings for all tool palettes (including the status of the Apply button for each palette) can be copied to the clipboard and saved in combined settings file. When the combined settings are pasted or read into the Nikon Capture 4 Editor, they will apply to all palettes simultaneously. These operations are performed using the commands in the **Settings**>**Image Adjustments** menu, which also contains an option for restoring all tool palettes to default settings.




| Option | Description |
|---|---|
| **Copy to Clipboard** | All image adjustment settings for the image in the active window are copied to the clipboard. You can paste them into the tool palettes for another window by selecting **Paste** from the **Edit** menu when the window is active. |
| **Load...** | Select this item to load settings previously saved using the **Save...** option (see below). A dialog will be displayed where you can navigate to the drive (volume) and directory containing the desired settings file (only files with the extension ".set" will be displayed). The settings in the Nikon Capture 4 Editor tool palettes will instantly revert to the saved settings. |
| **Save Selected Adjustments...** | Choosing **Save Selected Adjustments...** displays the Copy Image Adjustment dialog. Check the adjustments you want to save and click **Copy** to display a dialog where you can choose a destination and file name for the selected settings. The settings are saved with the extension ".set" and can later be recalled with the **Load...** option. If this file is later selected for batch processing, images will be processed according to the settings in the file (88, 112). |
| **Save All Adjustments...** | Select this item to save settings to a named file. These settings can later be recalled using the **Load...** option. Choosing **Save...** displays a dialog where you can choose a destination and file name for the current settings. If this file is later selected for batch processing, images will be processed according to the settings in the file (88, 112). Combination settings files are saved with the extension ".set". |
| **Reset to User Default** | Select this option to restore the default settings selected for **"User default" image adjustments** in the General tab of the Nikon Capture 4 Editor Preferences dialog (94). In the case of the default settings file ("Neutral.set"), RAW images taken with the D1x will be scaled to 100% (4,016×2,616 pixels). |
| **Reset All Adjustments to Neutral** | Resets all tool palettes to the settings in the default settings file ("Neutral.set"). Image adjustment settings in PictureProject will also be reset to defaults. |
| Recent files | Recent image adjustment settings files (up to four) are listed at the end of the settings menu. Selecting a file from the list restores the saved settings. |

## Saving Images

Nikon Capture supports a variety of file formats. Images displayed in Nikon Capture can be saved in a file format that suits the end in view. Hints for choosing a file format may be found on the pages that follow.

### Choosing a File Type

Nikon Capture 4 supports the following file types when saving images:

| File type | Compression | Extension |
|---|---|---|
| NEF (Nikon Electronic Image Format) | Uncompressed | .NEF |
| | Compressed | |
| 16-bit TIFF (RGB) | Uncompressed | .TIF |
| 8-bit TIFF (RGB) | | |
| TIFF (CMYK) | | |
| JPEG | Compressed | .JPG |

*Nikon Electronic Image Format (NEF)*

Images saved in NEF format maintain the high quality of the original photograph; adjustments to settings are not applied to the original image data, but are instead saved separately in the same file. NEF images can later be opened in Nikon Capture and saved again in a format that can be opened in other applications. As changes to settings are only applied to the original image data when the image is saved in another format, this minimizes any loss of image quality that may be produced when the image is edited. Save images in NEF whenever you are unsure of how they will be used or when you want to process the original image in a number of different ways.

NEF images created in Nikon Capture 4 can only be opened in Nikon Capture 4, or in Adobe Photoshop 6.0 or later using the Nikon NEF filter supplied with this product. Photographs recorded at an image quality setting of uncompressed NEF (RAW) can be compressed when saved in NEF format (compressed RAW images are automatically saved in compressed NEF format, and can not be saved in uncompressed NEF format).

*TIFF*

Use TIFF when saving images for high-quality output or publishing. Although the lack of compression will result in larger files, image quality will be maintained at a high level. TIFF also preserves the ICC profile and caption information. This format is supported by a wide variety of applications on a variety of platforms.

*JPEG*

This file type is adequate for images that will be output at low resolution or distributed in electronic form. Compression allows more images to be saved in the same amount of disk space while preserving the ICC profile and caption information. Note, however, that JPEG compression results in loss of image information that can not afterwards be restored. Save files at the lowest compression ratio possible; if necessary, they can always be saved again at a lower compression ratio.

## Options for Saving Image Files

Nikon Capture offers two options for saving files: **Save** and **Save as...**. The **Save** option saves the image in the same location as the original without changing the file name or format. The **Save as...** option lets you choose a location, file name, and format. When the Multi-Image window is active, only the images selected in the thumbnail area are saved.

*Using the "Save" Command*

1 Click the button or select **Save** from the **File** menu

The existing file will be overwritten. If the image is in JPEG format, a dialog will be displayed where the compression ratio can be selected from "Highest Compression Ratio," "Good Compression Ratio," "Good Balance," "Good Quality," and "Excellent Quality."

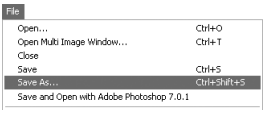
2 Confirm progress in the Save Progress window (83)

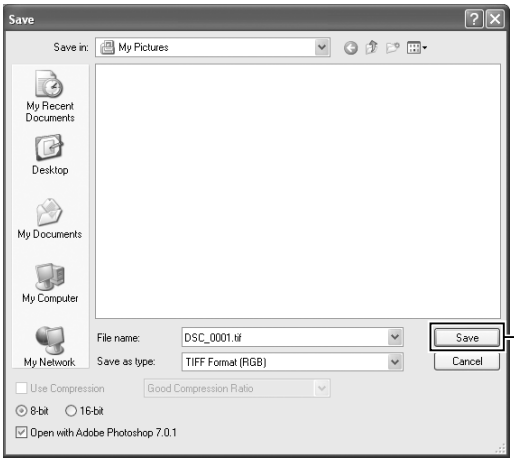
If the **Use Save Progress Window** option is not selected in the General tab of the Preferences dialog (95), files will be saved immediately, and the Save Progress window will not be displayed. The Save Progress window is not available in Windows 98 SE, Windows Me, or Mac OS 9.

*Using the "Save as..." Command*

1 Select **Save As...** from the **File** menu

The standard Save dialog for your operating system will be displayed.




**Save** button

### Images Saved in Nikon Capture 4

Images saved in Nikon Capture 4 can not be viewed on a camera.

### The Button

Clicking the button saves any changes to the current file, overwriting the original image. The Save dialog is not displayed.

**2** Choose a location
Navigate to the desired drive (volume) and folder.

**3** Choose a file type
Choose a file type (file format) from the pop-up menu. See "Choosing a File Type" (79) for more information.

**4** Adjust compression settings
If NEF is chosen in Step 3 when saving uncompressed RAW images, compression can be turned on by selecting **Use Compression**. Uncompressed RAW images saved at this setting will be compressed using a lossless compression algorithm. This check box is automatically enabled when a compressed RAW image is saved. Compressed RAW images can not be saved in uncompressed format.

**Use Compression** is automatically selected when images are saved in JPEG format. The compression ratio can be selected from "Highest Compression Ratio," "Good Compression Ratio," "Good Balance," "Good Quality," and "Excellent Quality."

**5** Enter a name for the file
The default file name appears in the **File name** text box. A new file name can be entered if desired.

**6** Click **Save**
If the **Use Save Progress Window** option is selected in the General tab of the Preferences dialog (95), a window will be displayed where the progess of the save operation can be viewed while other operations are performed. If this option is not selected, files will be saved immediately, and no progress dialog will be displayed. The Save Progress window is not available in Windows 98 SE, Windows Me, or Mac OS 9.

### File Naming Conventions

**Windows**: *In environments that do not support long file names*, the maximum length is eight characters; file names may not contain spaces, quotes, or any of the following characters: "\\" "/" ":" "." ";" "*" "?" "<" ">" and "|".

*Where long file names are supported*, the maximum length is 255 characters; file names may not contain quotes or any of the following characters: "\\" "/" ":" "." ";" "*" "?" "<" ">" and "|".

**Macintosh**: The maximum length for Macintosh file names is thirty-one characters. Colons (":") are not allowed.

### NEF

NEF files created with Nikon Capture 4 can not be opened in earlier versions of Nikon Capture. Nikon Capture 4 can however be used to open NEF images created with earlier versions of Nikon Capture.

### JPEG

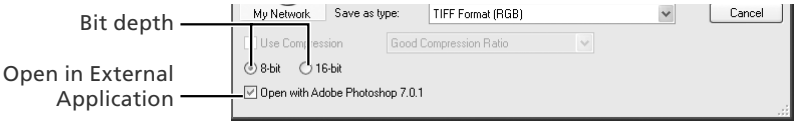
Image quality may drop when images are saved in JPEG format. No drop in image quality occurs when images are saved in NEF.

### Error Messages

If an invalid file name or other error is identified in the Save dialog, a message will be displayed. Adjust settings as directed.

## Save Options

In addition to the settings listed above, the following options are available in the Save dialog:




### Bit depth

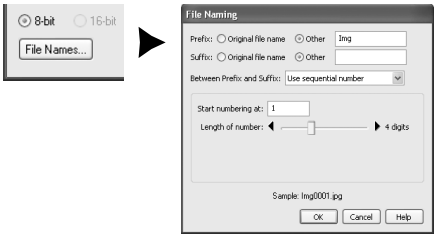
Gives the bit depth (the number of bits of color information per channel for each pixel in the image) at which the image will be saved. The 16-bit option is only available if the selected file type is TIFF format (RGB) and the original image has a bit depth of over eight bits.

### Open in

If **Open saved images with** is selected in the General tab of the Preferences dialog, the name of the selected application (e.g., Adobe Photoshop 7.0) will be displayed. This option can not be selected if the chosen file format is NEF. If this check box is on, the image will automatically be opened in the selected application after being saved to disk.

### File Names...

If multiple images are selected in the Multi-Image window, a **File Names...** button will be displayed. Click this button to view or modify file-naming rules.




## The Multi-Image Window

If the image in the Multi-Image window is saved under another name using the **Save As...** option, the original image will still be displayed in the image area.

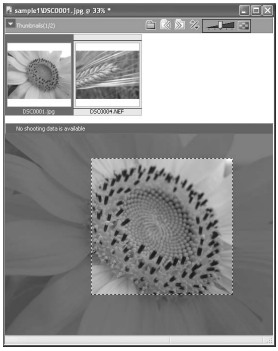
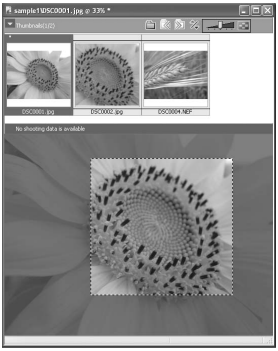
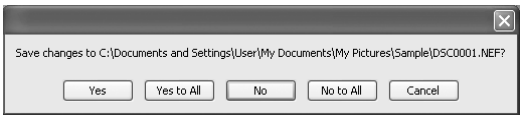


Image selected in thumbnail list is displayed in image area. If image is edited, asterisk ("*") appears in title bar.

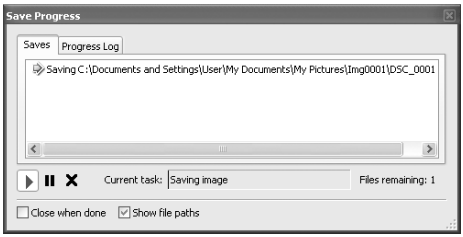


If image is saved to current folder under new name, modified image appears in thumbnail list, but original is still displayed in image area.

If changes to the originals have not been saved using the **Save** option, the dialog shown at right will be displayed when you exit Nikon Capture 4 Editor or close the Multi Image Window. Click **Yes** or **Yes to All** to save the changes under the original file names.



**The Save Progress Window (Windows 98 SE/Windows Me/Mac OS 9 Excluded)**




If the **Use Save Progress Window** option is selected in the General tab of the Preferences dialog (95), the Save Progress window will be displayed while images are saved (the Save Progress window is not available in Windows 98 SE, Windows Me, or Mac OS 9). The Save Progress window shows all save operations currently in progress, and can be used to pause, restart, or cancel the current task. If the Save Progress window is displayed, other operations can be performed while images are saved.

*Close when done*
If this option is selected, the Save Progress window will close automatically when all images have been saved.

*Show file paths*
Check this option to display file paths (volume and folder names) in the Save Progress dialog. If this option is not selected, only file names will be displayed.

*Saves*
This tab lists the names and status of files that have yet to be saved.

*Progress Log*
Lists warnings, errors, and completed or cancelled tasks.

Pause, restart, or cancel the selected operation.

*Reopen (Progress Log tab)*
Reopen the selected file in an image window.

*Show only erros and warning(Progress Log tab)*
Check this option to display only warnings and errors in the Progress Log tab. If this option is not selected, the Progress Log tab will also list completed operations.

*Clear (Progress Log tab)*
Clear the list of warnings, errors and completed or cancelled tasks from the Progress Log tab.

**The Save Progress Window**

The following operations can not be performed while a save is in progress:
- Opening the "Preferences" dialog
- Exiting Nikon Capture 4 Editor.

## Printing Images

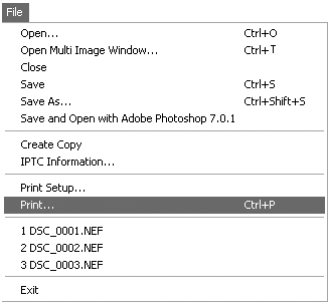
Images can be printed directly from Nikon Capture 4 Editor to test the effects of image adjustments.

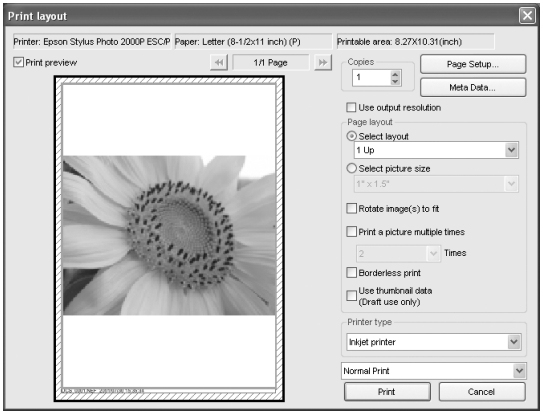
### 1 Open the image

Be sure the image you wish to print is open in Nikon Capture 4 Editor.

### 2 Select **Print...** from the **File** menu

The Print Layout dialog will be displayed.




### 3 Print the image

Adjust settings as described below and click **Print** to print the image. Click **Cancel** to exit without printing.

#### Printer/Paper/Printable area

These text boxes display current printer settings. To change printer settings, click **Page Setup...** (see below).

| | |
|---|---|
| Printer | Displays the currently selected printer. |
| Paper | Displays the current paper size. |
| Printable area | Displays the maximum dimensions of the area that can be printed per sheet at current printer and paper size settings. |

#### Print preview

Check this option to display a preview of how the images will print on the currently selected printer. Click the next page button to page through the selected images.

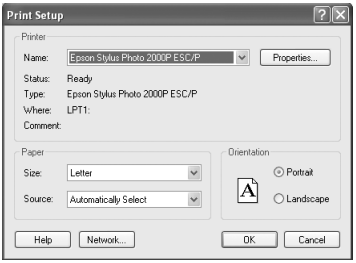
#### Copies (Windows only)

Choose the number of copies that will be printed. Up to 100 copies can be printed.

In the Macintosh version, the number of copies is not displayed in the Print Layout dialog. To specify the number of copies, click **Print**. A confirmation dialog will be displayed; click **Yes** to proceed with printing and specify the number of copies.

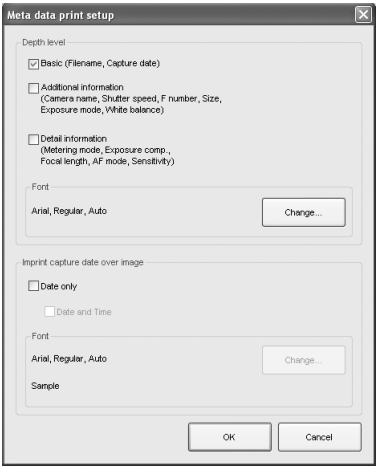
### Page Setup…

Click to display a Printer Settings dialog in which you can modify the printer and paper settings. If you are using a Macintosh, the appearance of this dialog depends on the printer in use. The changes made are reflected in the "Printer," "Paper," and "Printable area" fields.




### Meta Data…

To choose the information to be included with each print, click **Meta Data…**. The "Meta data print setup" dialog will be displayed; adjust the following settings and click **OK** to return to the "Print layout" dialog.




**Depth level**: Put a check in the box next to the level of information you want included with your prints. Choose from:

- **Basic**: file name and date and time of recording
- **Additional information**: camera model, shutter speed, aperture (f/-number), image size, exposure mode, and white balance
- **Detail information**: metering mode, exposure compensation, focal length, autofocus mode, and sensitivity (ISO equivalency)

To change the font used to print shooting information, click **Change**.

**Imprint capture date over image**: Select **Date only** to print the date of recording on the image, or **Date and Time** to print the date and time of recording. To choose the font used to print the date or date and time, click **Change**.

### Use output resolution

Check this option to print the image at its native resolution and dimensions. In Nikon Capture 4, this is the size and resolution selected in the Nikon Capture 4 Editor Size/Resolution palette (75). If the image will not fit in the printable area (see above) at the current printer and paper size settings when you click the **Print** button to begin printing, a message will be displayed warning that the image will be cropped to fit the printable area. Choose a larger paper size or reduce the size of the image using the Size/Resolution palette.

**Use output resolution** is not available when multiple images are selected.

Page Layout

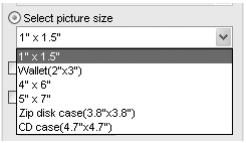
Choose from **Select layout** and **Select picture size** and adjust options as described below.

**Select layout**: When this option is selected, you can choose the number of images that will be printed from a drop-down menu.

| Option | Page orientation | |
|---|---|---|
| | Portrait | Landscape |
| **1 Up** | One image printed in center of page | One image printed in center of page |
| **2 Up** | Two pictures printed one above the other | Two pictures printed side-by-side |
| **2 × 2 Up** | Four pictures printed in two rows of two columns each | Four pictures printed in two rows of two columns each |
| **2 × 4 Up** | Eight pictures printed in four rows of two columns each | Eight pictures printed in two rows of four columns each |
| **4 × 4 Up** | Sixteen pictures printed in four rows of four columns each | Sixteen pictures printed in four rows of four columns each |
| **5 × 5 Up** | Twenty-five pictures printed in five rows of five columns each | Twenty-five pictures printed in five rows of five columns each |
| **5 × 8 Up** | Forty pictures printed in eight rows of five columns each | Forty pictures printed in five rows of eight columns each |
| **Image information list** | Print page consisting solely of the following information for the selected images: file name, camera make and model, exposure program, date and time of creation, shutter speed, aperture, and white balance. | |

The size of the images is automatically adjusted according to the layout. Select **Rotate images to fit** to rotate images to print at the largest size that will fit on the selected paper size.

**Select picture size**: When this option is selected, you can choose print size from a drop-down list.



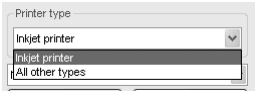

**Rotate image(s) to fit**: Check this option to automatically rotate each image so as to minimize the unused space inside each image frame.

**Print a picture multiple times**: To print multiple copies of each image, check this option and select a number from between two and ten from the pull down menu. Select **The whole page** to print enough copies of the image to fill the whole page at the selected size.

**Borderless print** (Windows)/**Eliminate white border** (Macintosh): Check this option to adjust the image size so that it fits exactly inside the red border, without leaving any white space. If the aspect ratio of the box and the image differ, part of the image may not be printed.

Use thumbnail data
Check this option to print the pictures at draft resolution using thumbnail data. Recommended for draft prints only.

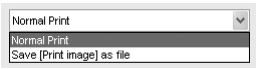
Printer type
Choose from **Inkjet printer** or **All other types**.




**Inkjet printer**: We recommend this option when printing on inkjet or color laser printers. The selected images will be printed at high quality and speed at the highest resolution supported by the printer (if the printer supports resolutions higher than 360 dpi, the images will print at 360 dpi).

**All other types**: Select this option when printing in color on devices that use dye-sublimation or photographic processes. The selected images will be printed at the highest resolution supported by the printer. Print speed may drop if you choose this option when using an inkjet printer.

Normal Print/Save [Print Image] as file
Select whether to print images on a printer, or to save the page as an image file.




**Normal Print**: Outputs the selected images to a printer.

**Save [Print Image] as file** (Windows)/**Save image files** (Macintosh): Saves the page as a JPEG file using the layout specified in the "Page Layout" dialog. When this option is selected, the **Print** button in the "Page Layout" dialog will change to **Save**. Clicking the **Save** button displays the "Save Image(s)" dialog, where you can choose a destination folder and file name and select **Quality** (JPEG compression) from **Maximum**, **High**, **Medium**, or **Low**. Each page is saved as a separate file.

**Setting up Your Printer**
Note that the printer must be properly connected and the printer drivers correctly installed.

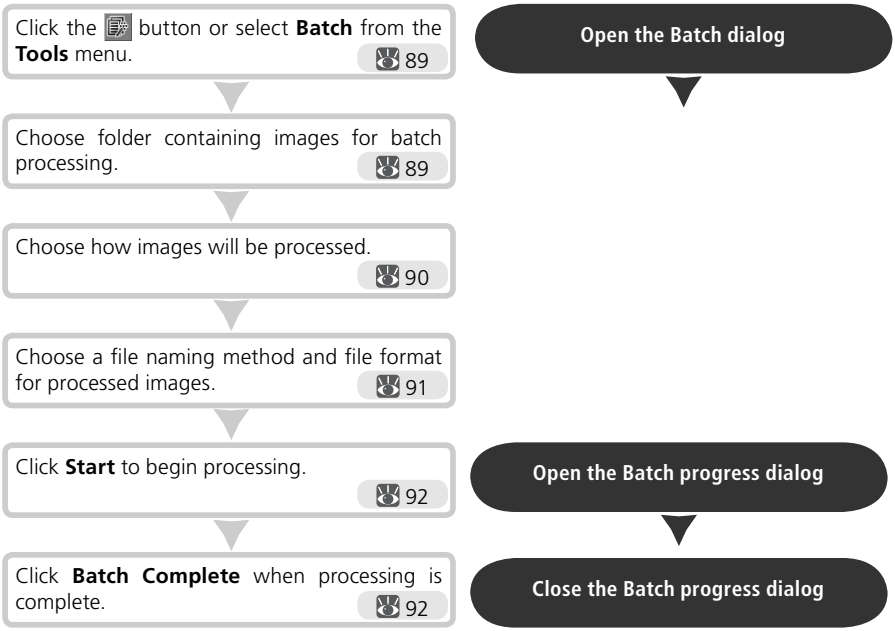
**Printing with Color Management**
The printer profile can be selected in the Color Management tab of the Preferences dialog in Nikon Browser, Nikon Viewer, Nikon Capture 4 Editor (98, 99), or Nikon Capture 4 Camera Control.

**"Use Output Resolution"**
To print images at the size and resolution selected in the Nikon Capture 4 Editor Size/Resolution palette, select **Use output resolution**.

## Batch Processing

Nikon Capture 4 supports automated processing of multiple images (batch processing). Batch processing is used to automate image processing, capturing images, applying pre-defined image adjustment settings, and saving images to disk automatically. It is most effective when applied to a series of photographs taken under identical conditions. Images are processed in the order taken.

When using batch processing, we recommend that you open one of the images to be processed in Nikon Capture 4 and edit image adjustment settings to produce the desired result. You can then save these settings in a joint settings file using the **Save Selected Adjustments** or **Save All Adjustments** option in the **Settings** > **Image Adjustment** menu (78). By selecting the resulting settings file in the Batch dialog, you can perform the same adjustments on all the images processed. In studio settings where a variety of shooting conditions can be replicated with ease, you can create separate settings files for commonly encountered conditions and use these settings to automate repetitive image enhancement operations.


Click the button or select **Batch** from the **Tools** menu. 89
Open the Batch dialog
Choose folder containing images for batch processing. 89
Choose how images will be processed. 90
Choose a file naming method and file format for processed images. 91
Click **Start** to begin processing. 92
Open the Batch progress dialog
Click **Batch Complete** when processing is complete. 92
Close the Batch progress dialog

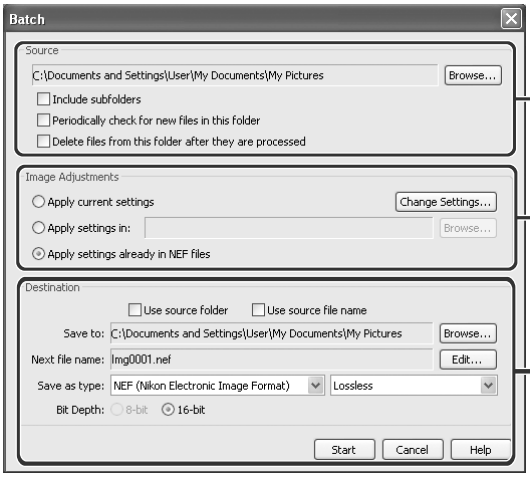
### Before Using Batch Processing

Batch processing is used to perform the operations specified in the Image Adjustments section of the Batch dialog on all files in a selected folder. To ensure that desired results are achieved, we recommend processing a test image before beginning batch processing. Batch processing can not be used to adjust settings separately for each image; instead, the images must be opened one at a time in the order taken and separate adjustments made manually for each image.

This section describes how to use batch processing with files that have already been saved to the computer's hard disk. For information on batch processing of images captured directly from the camera, see "Nikon Capture 4 Camera Control" (112).

## 1 Display the Batch dialog

Click the button or select **Batch** from the **Tools** menu to displaythe Batch dialog.




## 2 Choose a source folder

In the Source section, choose the folder containing the images to be processed. The current folder is listed in the text box. To choose a new folder, click the **Browse...** button and navigate to the desired location.

### Include subfolders

Check this option to process all images in any sub-folders under the specified folder. Folders with the same names will be created in the destination folder.

### Periodically check for new files in this folder

When this option is checked, Nikon Capture 4 will check for new images in the specified folder once every ten seconds. This option is not available when **Include subfolders** is checked.

### Delete files from this folder after they are processed

Check this option to delete image files from the selected folder after processing. A warning dialog will be displayed before batch processing begins. This option is not available when **Use source file name** is selected in the Destination section or when **Use Save Progress Window** is selected in the General tab of the Preferences dialog.

**Selecting Folders for Batch Processing**

For improved efficiency, create two folders that are used only for batch processing, one for the orginals and the other for processed images.

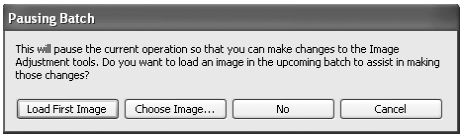
## 3 Specify how images will be processed

In the Image Adjustments section, specify the operations to be performed on each image.

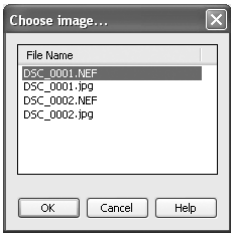
### Apply current settings

Select this option to process the images in the selected folder using the settings currently in effect in Nikon Capture 4 Editor.

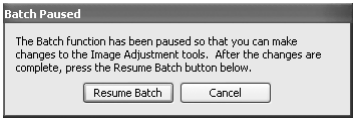
To change settings before beginning batch processing, click **Change Settings...**. A dialog will be displayed where an image can be opened to assist with the process of adjusting settings. Click **No** to adjust settings without opening an image.


Pausing Batch
This will pause the current operation so that you can make changes to the Image Adjustment tools. Do you want to load an image in the upcoming batch to assist in making those changes?
Load First Image
Choose Image...
No
Cancel

To open the first image in the source folder, click **Load First Image**. To select another image from the source folder, click **Choose Image...**. The dialog shown at right will be displayed; select an image and click **OK**.




A pause dialog will be displayed; adjust settings as desired and then click **Resume Batch** to return to the batch processing dialog.


Batch Paused
The Batch function has been paused so that you can make changes to the Image Adjustment tools. After the changes are complete, press the Resume Batch button below.
Resume Batch
Cancel

### Apply settings in

Select this option to process the images in the selected folder using joint settings created using the **Save Selected Adjustments** or **Save All Adjustments** option in the **Settings** > **Image Adjustment** menu (78; note that if **Calculate Automatically** is selected for white balance in the settings file, the recorded value will be used when images are processed). When this option is selected, a joint settings file can be selected by clicking the **Browse** button to its right.

### Apply settings already in NEF files

Check this option to apply settings previously saved with NEF files. If this item is not checked, the saved settings will be replacing with the settings chosen in the Image Adjustments section.

#### Orientation

Images processed using the batch option are saved in their original orientation. When **Apply current settings** is selected, images will not be rotated or flipped, regardless of whether flips or rotations have been applied to the image in the active image window.

#### Existing Image Adjustment Settings

If the **Apply settings already in NEF files** option is not checked, any changes to settings stored with files saved in NEF format will be ignored, and the settings in the selected settings file applied. If you have processed a series of NEF images separately and want to save them all as sixteen-bit TIFF, you can check this option and use batch processing to save all the images to a single folder in sixteen-bit TIFF format.

## 4 Choose a destination for the processed images

In the Destination section, choose options for saving the processed images.

### Use source folder

When this option is selected, processed images will be saved to the same folder as the original.

### Use source file name

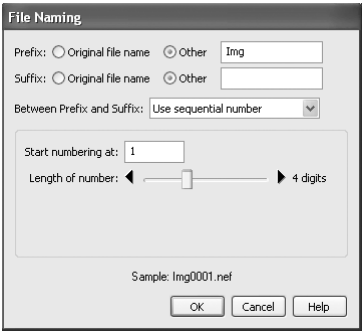
When this option is selected, processed images will be saved under the same name and in the same location as the original images, although the file extension will change if the chosen file format differs from the original. A warning will be displayed if the file name already exists. This option can not be selected at the same time as **Delete files from this folder after they are processed**, and is not available when **Use Save Progress Window** is selected in the General tab of the Preferences dialog.

### Save to

This text box shows the folder to which the images will be saved after processing. To choose a new folder, click the **Browse...** button to the right of the text box and navigate to the desired location. This option is not available when **Use source folder** is selected. A folder with the same name will be created in the destination folder.

### Next file name

This text box shows a sample of the file names that will be used when saving the images after processing. To choose a new file name, click the **Edit...** button. The File Naming dialog will be displayed.




### Save as type

Choose the file format that will be used to save the processed images. The following formats are available: **Use source file type**, **NEF (Nikon Electronic Image Format)**, **TIFF Format (RGB)**, **TIFF Format (CMYK)**, and **JPEG Format**. When NEF is selected, compression can be chosen from a pull-down menu. When JPEG is selected, the compression ratio can be chosen from "Highest Compression Ratio," "Good Compression Ratio," "Good Balance," "Good Quality," and "Excellent Quality." For more information on the options available, see "Saving Images" (79).

### File Naming Conventions

**Windows**: *In environments that do not support long file names*, the maximum length is eight characters; file names may not contain spaces, quotes, or any of the following characters: "\\" "/" ":" "." ";" "*" "?" "<" ">" and "|".

*Where long file names are supported*, the maximum length is 255 characters; file names may not contain quotes or any of the following characters: "\\" "/" ":" "." ";" "*" "?" "<" ">" and "|".

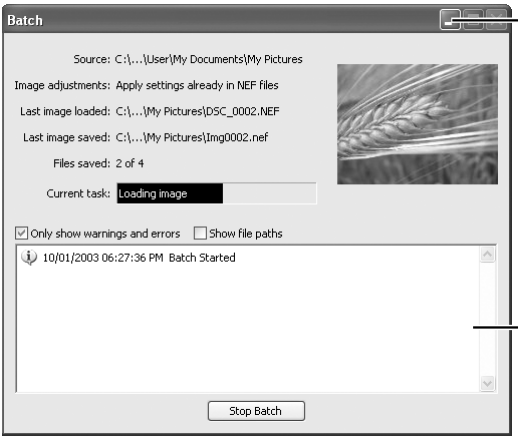
**Macintosh**: The maximum length for Macintosh file names is thirty-one characters. Colons (":") are not allowed.

### Bit Depth

Gives the bit depth (the number of bits of color information per channel for each pixel in the image) at which the image will be saved. The 16-bit option is only available if the selected file type is TIFF format (RGB) and the original image has a bit depth of over eight bits.

## 5 Begin processing

Click **Start** to put the selected settings into effect and begin processing. A batch progress dialog will be displayed (exceptin Windows 98 SE, Windows Me, or Mac OS 9, the Save Progress window will be displayed if **Use Save Progress Window** is selected in the General tab of the Preferences dialog; 95).




### Stop Batch

Click this button to stop batch processing before all images have been processed.

### Only show warnings and errors

Check this option to display only warnings and errors in the log area. If this option is not checked, the log will also show the names and locations of the original images, captured photographs, and processed images.

### Show file paths

Select this option to show the source and destination file paths. File paths are not displayed if **Only show warnings and errors** is checked.

## 6 Exit the batch processing dialog

When batch processing is complete, the **Stop Batch** button will change to **Batch Complete**. Click **Batch Complete** to exit the batch processing dialog.

### The Log Area

If an error occurs during processing, a description will be displayed in the log area of the batch dialog.

### Error Messages

If an invalid file name or other error is identified in the batch processing dialog, a message will be displayed. Return to the batch processing dialog and adjust settings as directed in the message.

### The Minimize Button (Windows)

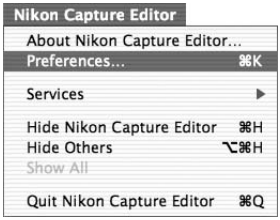
Clicking the minimize button in the batch processing dialog minimizes Nikon Capture 4 Editor.

# Nikon Capture 4 Editor Preferences

*Fine-Tuning Nikon Capture 4 Editor*

To view the Preferences dialog, select **Options...** from the **Tools** menu (Windows) or select **Preferences...** from the application menu (Mac OS X) or **Edit** menu (Mac OS 9).

Windows




Mac OS X

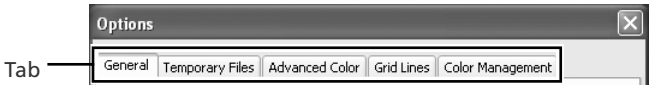
The Preferences dialog contains the following five tabs:

| Tab | Description | |
|---|---|---|
| General | Adjust application settings. | 94 |
| Temporary Files | Specify the location of the folders used for temporary storage. | 96 |
| Advanced Color | Set the defaults for the white and black points in the Curves window. | 96 |
| Grid Lines | Specify the spacing and color of the grid displayed in image windows. | 97 |
| Color Management | Select the color profiles used by the Nikon Color Management System (CMS). | 98<br>99 |

After making changes to preferences, click **OK** to save changes and return to the Nikon Capture 4 Editor window. Click **Cancel** to cancel any changes to settings and return to the Nikon Capture 4 Editor window.

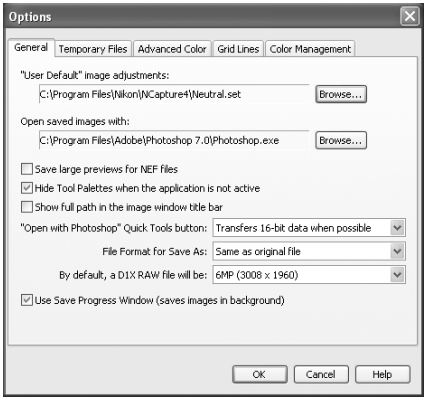
### Viewing Preferences

To view settings in any of the five panels, click the appropriate tab.

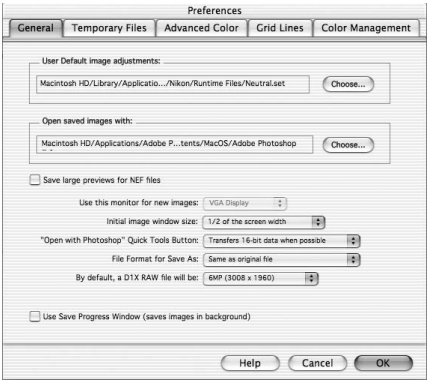


## The General Tab

The General tab contains the following items:




Windows




Macintosh

### *"User Default" image adjustments*

Choose the combined settings (".set") file that will apply when **Reset to User Default** is selected from the **Settings**>**Image Adjustments** menu (78). The factory default settings file ("Neutral.set") produces a neutral, unedited image.

### *Open saved image with*

To specify the application used to open saved images, click the **Browse...** button and navigate to the desired application. This setting has no effect on the ( ) ("Open in Photoshop") button in the Quick Tools palette (9).

### *Save large previews for NEF files*

Image files normally include an embedded preview 640 pixels on its longest size. If this option is checked, images saved in NEF will include a preview 1,600 pixels on its longest side, allowing NEF images over 1,600 pixels long to display more quickly in Nikon Viewer.

### *Hide Tool Palettes when the application is not active* (Windows only)

Select this option to hide the tool palettes and Quick Tool palette when another application is activated and brought to the front.

### *Show full path in the image window title bar* (Windows only)

Select this option to display the full paths and file names of the images opened in image windows.

### *Use this monitor for new images* (Macintosh only)

In a multiple display environment, select the monitor that will be used to display images opened in Nikon Capture 4 Editor. This option is not available when only one monitor is connected.

**Large Previews for NEF Files**

Selecting the **Save large previews for NEF files** option increases file size by about 1 MB, slightly increasing the time needed to save images.

*Initial image window size* (Macintosh only)
Choose the size at which images will be opened from one-third screen width, one-half screen width, and two-thirds screen width.

*"Open with Photoshop" Quick Tools button*
Choose whether images are transferred to Photoshop eight bits at a time (**Always transfers 8-bit data**) or sixteen bits at a time (**Transfers 16-bit data when possible**) when the button in the Quick Tools palette is clicked to open an image in Photoshop (9). If sixteen-bit transfer is not possible when **Transfers 16-bit data when possible** is selected, images will be transferred eight bits at a time.

*File format for Save As*
Choose the default file format for images saved using the **Save As...** option (79). Choose from **Same as original file** (each image will be saved in its current format), **Previous file format** (images will be saved in the last format selected), NEF, JPEG, TIFF (RGB), and TIFF (CMYK).

*By default, a D1X RAW file will be*
This option controls the default size for RAW images taken with the D1x. Choose **10MP (4016 × 2616)** or **6MP (3008 × 1960)**.

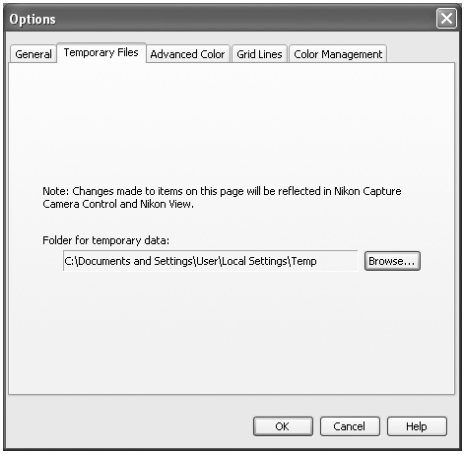
*Use Save Progress Window (save images in background)*
Select this option to display the Save Progress Window while images are saved (83). This option can not be selected in Windows 98 SE, Windows Me, or Mac OS 9.

**Use Save Progress Window**
The **Periodically check for new files in this folder** and **Delete files from this folder after they are processed** options are not available in the batch progress dialog when **Use Save Progress Window** is selected (88).

**Opening Files with Photoshop (Mac OS 9)**
A temporary file is created each time an image is opened in Photoshop. These files are normally deleted when the computer restarts. In Mac OS 9, however, the files are locked and cannot be deleted; instead, they are moved to the Trash. To delete files, select **Empty Trash** from the **Special** menu in the Finder while pressing the option key.

## The Temporary Files Tab

The Temporary Files tab offers the following option:

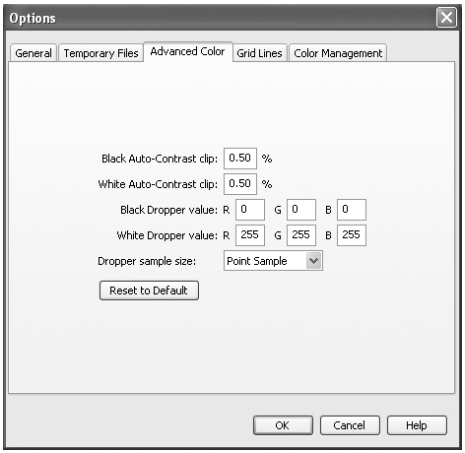



*Folder for temporary data*

Specify the folder or volume in which temporary data, such as image cache data, will be stored. The default folder for Windows is the "TEMP" folder in the Windows directory, while the default volume for the Macintosh is the start-up disk. To choose a different folder in the Windows version of the program, click the **Browse...** button and navigate to the desired location. In the Macintosh version, a new volume can be chosen from the pop-up menu.

## The Advanced Color Tab

The Advanced Color tab contains the following items:




*Black Auto-Contrast clip*

By default, the black point is set to a value that excludes 0.5% of the darkest pixels in the crop. This produces an optimal dynamic range, with minimal loss of detail in shadows. To preserve detail at the expense of dynamic range, choose a lower value (choose 0 to set the black point to the darkest pixel in the crop). To increase dynamic range at the expense of detail, choose a higher value.

*White Auto-Contrast clip*

By default, the white point is set to a value that excludes 0.5% of the brightest pixels in the crop. This produces an optimal dynamic range, with minimal loss of detail in highlights. To preserve detail at the expense of dynamic range, choose a lower value (choose 0 to set the white point to the brightest pixel in the crop). To increase dynamic range at the expense of detail, choose a higher value.

**The Temporary Files Tab**

Changes to settings in the Temporary Files tab also apply to Nikon Capture 4 Camera Control. Nikon Capture 4 must be restarted before changes to settings will take effect.

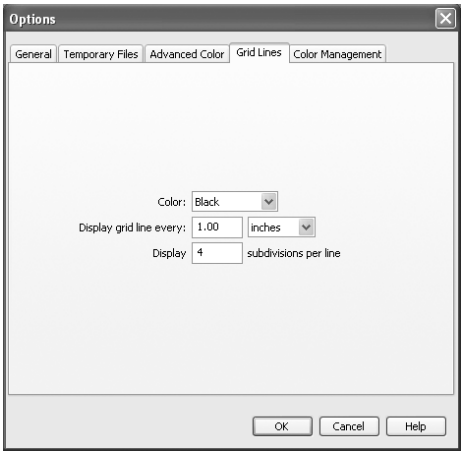
*Black Dropper value/White Dropper value*
Controls the default output values for white point and black point. Output for each channel can be set to a value between zero and 255; these settings can also be adjusted in the Curves window. By default, output levels for the white point are 255 for each channel, which displays as white on most computer monitors. The defaults for the black point are 0 for each channel, which displays as black.

*Dropper sample size*
This setting determines the size of the area sampled with the eyedropper cursor in the White Balance and Curves palettes. You can select a sample sizes of **Point Sample** (the default setting), **3×3 Average**, and **5×5 Average**. When the sample size is set to 3×3 or 5×5, the average for the pixels sampled is used. Choosing a large sample size reduces precision, but also minimizes the effects of noise; choosing a small sample size has the opposite effect.

*Reset to Default*
Click this button to restore settings in the Advanced Color tab to their default values.

## The Grid Lines Tab

The Grid Lines tab controls the color and spacing of the non-printing grid lines overlaid on an image when **Show Grid Lines** is selected from the **Image** menu.



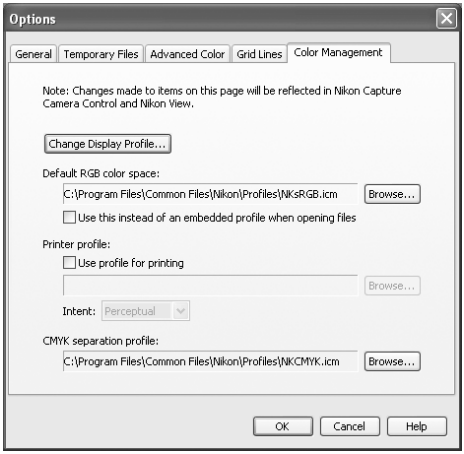

*Color*
The color of the grid lines can be selected from white, light gray, dark gray, black, red, green, blue, cyan, magenta, and yellow.

*Display grid line every*
Enter a value for grid spacing in the text box. The units for the grid can be selected from the pop-up menu to the right of the text box. The options available are pixels, inches, millimeters, centimeters, picas, and points; at settings other than pixels grid spacing can be entered up to two decimal points.

*Display n subdivisions per line*
The number of subdivisions into which each grid cell will be divided. The main grid is displayed as solid lines of the color specified using the Color option, the subgrid as broken lines of the same color.

## The Color Management Tab (Windows)

The Color Management tab is where you specify the color management profiles used for displaying images on your monitor, editing and saving RGB images, and saving and printing CMYK images.




*Change Display Profile*

To choose a display profile, click **Change Display Profile...**. The Windows "Display Properties" dialog will be displayed; open the Settings tab and click **Advanced...** to open the display adapter properties dialog. To select a display profile, open the Color Management tab and click **Add**.

*Default RGB color space*

The output color-space profile used when working with RGB images is displayed here. Click **Browse...** to choose a new default RGB profile. If **Use this instead of an embedded profile when opening files** is checked, this RGB color space profile will be used for all images. If it is not checked, the profile embedded in each image will be used.

*Printer profile*

Specifies the printer profile to be used when printing images.

*Use profile for printing*

If this option is checked, you can choose a profile for printing by clicking the **Browse...** button. The selected profile will appear in the adjacent text box. If this option is not checked, the default RGB color space will be used.

*Intent*

If you have chosen to use a printer profile, the type of matching to be performed can be selected from **Relative** and **Perceptual**. (Depending on the profile, changing the matching method may produce no change in output. This option is not supported with some profiles; consult the manufacturer for details.)

Relative

Colors not in the gamut of the selected printer profile will be printed using the closest colors available. Other colors are not affected.

Perceptual

If the image contains colors not in the gamut of the selected printer profile, all colors in the image will be compressed to fit the gamut.

*CMYK separation profile*

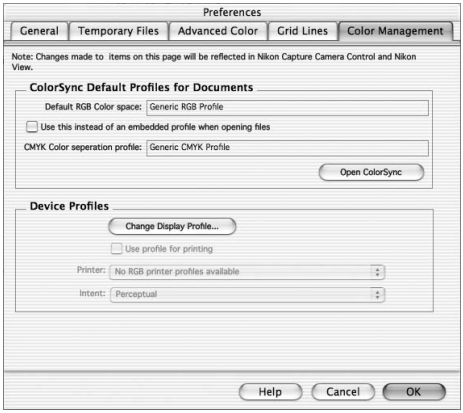
Lists the profile used to convert RGB images to CMYK when saving images in CMYK-TIFF format. To choose a different profile, click the **Browse...** button.

**Default Display Profile**

The default Windows display profile is "NKMonitor_win.icm." This profile is equivalent to sRGB.

## The Color Management Tab (Macintosh)

The Macintosh version displays the profile names selected in the ColorSync control panel (Mac OS 9) or in System Preferences (Mac OS X).




*ColorSync Default Profiles for Documents*

The default color-space profiles are displayed in this area. Clicking the **Open ColorSync** button opens the ColorSync dialog to a panel where you can choose the default profiles for the RGB and CMYK color spaces.

*Default RGB Color space*

Lists the output ICC color-space profile used when working with RGB images. If **Use this instead of an embedded profile when opening files** is checked, this RGB color space profile will be used for all images. If it is not checked, the profile embedded in each image will be used.

*CMYK Color Separation Profile*

Lists the profile used to convert RGB images to CMYK when saving images in CMYK-TIFF format.

*Open ColorSync*

Opens the ColorSync control panel (OS 9) or System Preferences (OS X), where you can choose the color profiles used.

**Supported Color Profiles**

Nikon Capture 4 supports only ICC (International Color Consortium) monitor and CMYK profiles. Particular care should be exercised when choosing a CMYK profile, as the profile supplied by the manufacturer of your output device may not be an ICC profile.

**Multiple Displays (Windows)**

In a multiple display environment, choose a single profile suited to all displays.

**The Color Management Tab**

Changes to settings in the Color Management tab also apply to Nikon Browser, Nikon Viewer, and Nikon Capture 4 Camera Control.

**RGB Color-Space Profiles**

See Appendix A (140) for more information on the default color-space profiles.

**The Information Palette**

The color-space profile for the image in the active window is displayed in the Information palette (21).

*Device Profiles*

Lists the default color-space profiles for monitors and printers.

*Change Display Profile*

If the **Change Display Profile...** button appears next to this item, you can click the button to open the Monitor control panel (Mac OS 9) or the Displays section of the System Preferences dialog (Mac OS X). Click the **Color** button (Mac OS 9) or open the Color panel (Mac OS X) to choose a display profile.

*Use profile for printing*

If this option is checked, the profile listed in the **Printer** text box will be used when printing images. Note that CMYK profiles can not be used in Nikon Capture 4; if a CMYK profile is selected, the status of the **Use profile for printing** check-box can not be changed. If **Use profile for printing** is not selected, images will be printed using the default RGB profile.

*Intent*

If you have chosen to use a printer profile, the type of matching to be performed can be selected from **Relative** and **Perceptual**. (Depending on the profile, changing the matching method may produce no change in output. This option is not supported with some profiles; consult the manufacturer for details.)

Relative

Colors not in the gamut of the selected printer profile will be printed using the closest colors available. Other colors are not affected.

Perceptual

If the image contains colors not in the gamut of the selected printer profile, all colors in the image will be compressed to fit the gamut.

**Multiple Displays (Macintosh)**

Nikon Capture 4 will identify and list the profiles for all monitors in an extended desktop display, allowing you to choose a separate profile for each monitor.

# Nikon Capture 4 Camera Control

*Capturing Photographs*

Using the Camera Control component of Nikon Capture 4, you can control almost all aspects of camera operation remotely from your computer. If Camera Control is running when a D2H, D100, or D70 is connected, or a D1-series camera is connected and set to PC mode, pictures taken with the camera will be stored on your computer hard disk, not the camera memory card. The camera can be operated either directly or using the controls in the Camera Control window. Camera settings are displayed in Camera Control.

This chapter describes the Camera Control and Custom Settings windows. For more information on camera settings, see the documentation provided with your camera.

*The Camera Control Window*
Read this section for a description of the controls in the Nikon Capture 4 Camera Control window, as well as for information on launching and closing the Camera Control window, capturing photographs to disk, processing photographs as they are captured, time lapse photography, and custom settings.

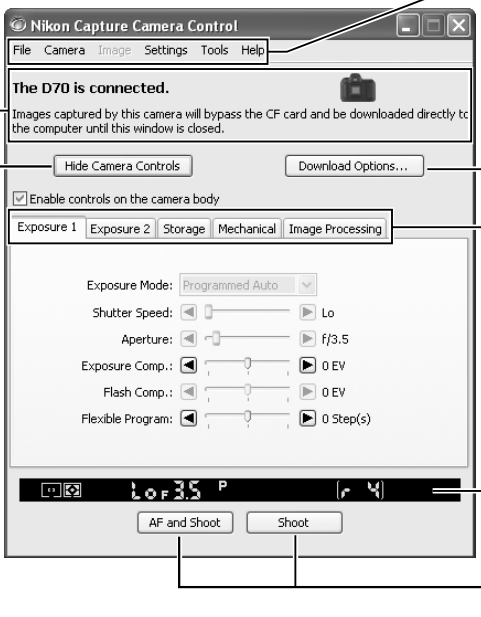
*Nikon Capture 4 Camera Control Preferences*
This section details the options available in the Camera Control Preferences dialog.

# The Camera Control Window

*Getting to Know Nikon Capture 4 Camera Control*

The main parts of the Camera Control window are identified below. For more information, see the "Nikon Capture 4 Camera Control Window" (119).

***Connection status (119)***
Shows the status and name of any cameras connected.


Nikon Capture Camera Control
File Camera Image Settings Tools Help
The D70 is connected.
Images captured by this camera will bypass the CF card and be downloaded directly to the computer until this window is closed.
Hide Camera Controls
Download Options...
Enable controls on the camera body
Exposure 1 Exposure 2 Storage Mechanical Image Processing
Exposure Mode: Programmed Auto
Shutter Speed: Lo
Aperture: f/3.5
Exposure Comp.: 0 EV
Flash Comp.: 0 EV
Flexible Program: 0 Step(s)
AF and Shoot
Shoot

***Menu bar***

***Download Options button***
Click this button to choose a destination for photographs captured from the camera.

***Camera control page selection tabs***
The menus, sliders, and buttons on each tab are used to control camera settings.

***Simulated LCD panel***
Performs the same function as the information display in the camera viewfinder.

***Shoot buttons***
Click these buttons to take pictures.

***Hide Camera Controls button***
Click this button to hide the camera control panels in the Nikon Capture Camera Control window.

### Camera Control

Changes made to settings in the Nikon Capture 4 Camera Control window only apply to photographs taken after the changes are made, not to photographs that have already been taken.

The controls in the Nikon Capture 4 Camera Control window vary with the type of camera connected. More information on camera settings may be found in the documentation provided with your camera.

### Camera Control for D100 Cameras (Macintosh)

Before using Nikon Capture 4 Camera Control with a D100 digital camera under Mac OS 9 or Mac OS X, confirm that the camera firmware is version 2.00 or later. Users of earlier versions will need to upgrade the camera firmware before using Nikon Capture 4 Camera Control. Contact a Nikon-authorized service representative for information on firmware upgrades.

### Illustrations

Save where otherwise noted, the illustrations in this section show the dialogs displayed when the D70 is connected.

If no camera is connected when Nikon Capture 4 Camera Control is launched, a warning will be displayed.

Nikon Capture Camera Control
No camera was found. If you already connected a camera, check the connection. If you connect a camera while this window is open, Image Transfer will not be used.
OK

Click **OK** to close the warning and display the following window. Preferences can be adjusted using the options in the menu bar. For information on connecting the camera, see the *Nikon Capture 4 Install Guide*.

Nikon Capture Camera Control
File Camera Image Settings Tools Help
No camera was detected.
Note that Image Transfer will not launch automatically while this window is open.
Show Camera Controls
Download Options...

***Download Options button***
Click this button to choose a destination for photographs captured from the camera.

### Before Starting Nikon Capture 4 Camera Control (D2H/D100/D70 Cameras)

Users of D2H, D100, and D70 cameras will need to ensure that the appropriate setting is chosen for **USB** option in the camera setup menu before connecting the camera to a computer running Nikon Capture 4 Camera Control. Choose a USB setting according to your computer's operating system:

| Operating system | D2H/D70 | D100 |
|---|---|---|
| Windows XP Home Edition, Windows XP Professional | Choose **PTP**. | Choose **Mass Storage** or **PTP**. |
| Windows 2000, Windows Me, Windows 98 SE | Choose **PTP**. | Choose **Mass Storage**. |
| Mac OS | Choose **PTP**. | Choose **PTP**. |

### Windows XP Home Edition/Professional, Windows 2000 Professional, Mac OS X

Installing, uninstalling, and using Nikon Capture 4 Camera Control under a multi-user operating system requires Administrator privileges. When using Nikon Capture 4 Camera control, log in as:

| | |
|---|---|
| **Windows XP Home Edition/Professional** | Computer administrator |
| **Windows 2000 Professional** | Administrators |
| **Mac OS X** | Admin |

## Starting Nikon Capture 4 Camera Control

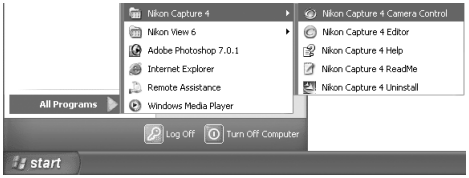
Nikon Capture 4 Camera Control can be started by selecting **Show Nikon Camera Control** from the **Tools** menu in Nikon Capture 4 Editor, or by clicking the button in the Nikon Capture 4 Editor Quick Tools palette. You can also start Camera Control directly by selecting Nikon Capture 4 Camera Control from the **Start** menu (Windows) or double-clicking the application icon (Macintosh).

**Windows**

1 Connect the camera
Connect the camera to your computer and turn the camera on. If you are using a D1-series camera, choose "PC" as the operating mode. If you are using a D100, choose **P**, **S**, **A**, or **M** mode. Users of the D2H can select any mode other than M-UP (mirror up). The D70 can be connected in any shooting mode.

2 Close Nikon Transfer
If Nikon Transfer starts, click the **Close** button.

3 Start Nikon Capture 4 Camera Control
From the **Start** menu, select **All Programs** > **Nikon Capture 4** > **Nikon Capture 4 Camera Control** (Windows XP Home Edition/Windows XP Professional) or **Programs** > **Nikon Capture 4** > **Nikon Capture 4 Camera Control** (other Windows versions).



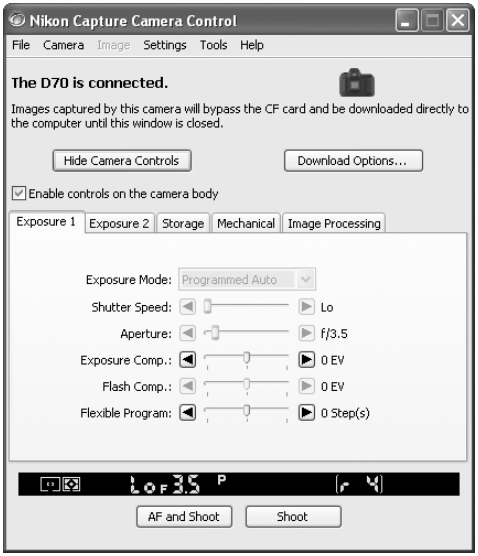

**Product Key**

If prompted to supply a product key when starting Nikon Capture 4 Editor or Nikon Capture 4 Camera Control, enter the product key for Nikon Capture 4.

**Other Ways of Starting Camera Control**

Nikon Capture 4 Camera Control can be started by double-clicking the Nikon Capture 4 Camera Control icon ( ) on the desktop.

The Camera Control window will be displayed.




**Disconnecting the Camera**

For information on disconnecting the camera from the computer, see the documentation provided with your camera.

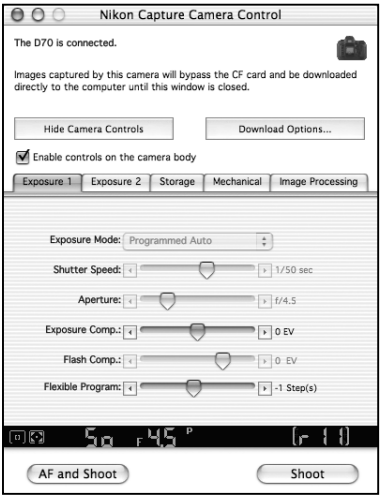
**Macintosh**

1 **Connect the camera**
Connect the camera to your computer and turn the camera on. If you are using a D1-series camera, choose "PC" as the operating mode. If you are using a D100, choose **P**, **S**, **A**, or **M** mode. Users of the D2H can select any mode other than M-UP (mirror up). The D70 can be connected in any shooting mode.

2 **Close Nikon Transfer**
If Nikon Transfer starts, click the **Close** button.

3 **Start Nikon Capture 4 Camera Control**
Double-click the Nikon Capture 4 Camera Control icon in the folder to which you installed Nikon Capture 4.

The Camera Control window will be displayed.




**Product Key**

If prompted to supply a product key when starting Nikon Capture 4 Editor or Nikon Capture 4 Camera Control, enter the product key for Nikon Capture 4.

**Other Ways of Starting Camera Control**

Nikon Capture 4 Camera Control can be started by double-clicking the Nikon Capture 4 Camera Control icon on the desktop. If Nikon Capture 4 was registered in the Dock during installation, Mac OS X users will be able to start Nikon Capture 4 Camera Control by clicking the Nikon Capture 4 Camera Control icon in the Dock.

## Exiting Nikon Capture 4 Camera Control

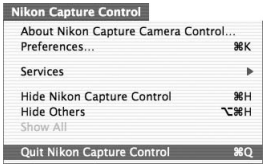
Be sure to exit Nikon Capture 4 Camera Control before disconnecting the camera.

1 Exit Nikon Capture 4 Camera Control

To close the Nikon Capture 4 Camera Control window, open the **File** menu and choose **Exit** (Windows) or **Quit** (Mac OS 9). In Mac OS X, select **Quit Nikon Capture Control** from the application menu.

Windows

Mac OS 9



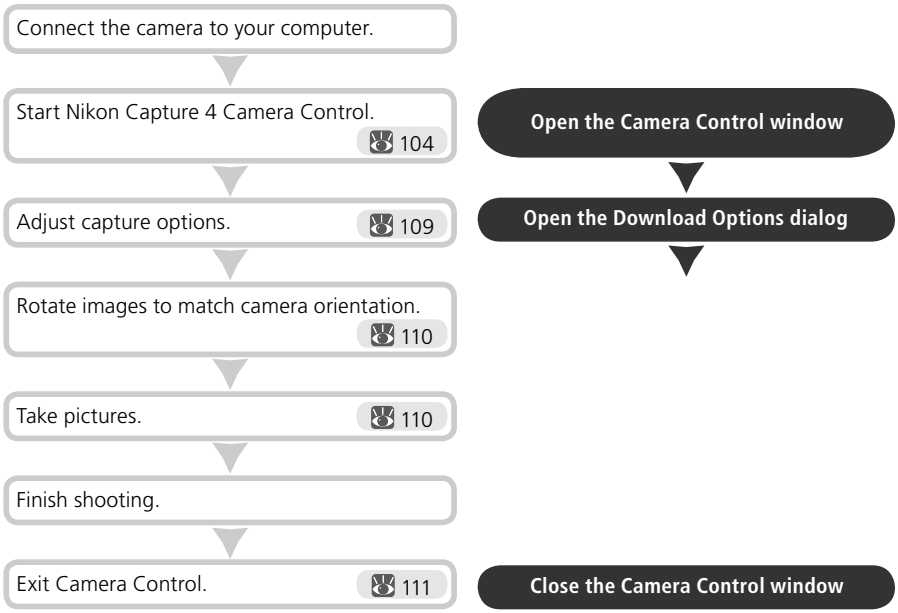

Mac OS X

2 Disconnect the camera

For information on disconnecting your camera from the computer, see the documentation provided with your camera.

## Capturing Photographs to Disk

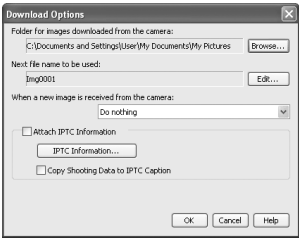
If Nikon Capture 4 Camera Control is running when a D2H, D100, or D70 is connected, or a D1-series camera is connected with the mode dial set to PC, pictures taken with the camera will be stored on your computer hard disk, not the camera memory card.


Connect the camera to your computer.
Start Nikon Capture 4 Camera Control. 104
Adjust capture options. 109
Rotate images to match camera orientation. 110
Take pictures. 110
Finish shooting.
Exit Camera Control. 111
Open the Camera Control window
Open the Download Options dialog
Close the Camera Control window

### 1 Start Nikon Capture 4 Camera Control (104)

### 2 Display the Download Options dialog

Click **Download Options** in the Camera Control window. The dialog shown at right will be displayed.




### Auto Image Rotation (D2H and D70 Only)

If **On** or **Automatic** (the default setting) is selected for the auto image rotation option in the camera setup menu, the D2H and D70 will detect camera orientation and automatically rotate photographs as they are taken (note that in continuous mode, the rotation applied to the first image in each burst applies to all images in the series, even if camera orientation is changed during shooting). If **Off** is selected, all images will be recorded in landscape orientation regardless of how the camera is held. Images can be rotated using the options in the **Image** menu.

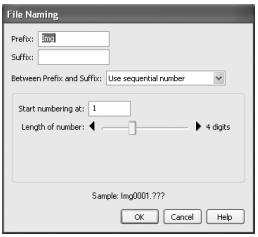
## 3 Adjust capture options

### Folder for images downloaded from the camera

Select the folder to which photographs will be downloaded as they are taken.

### Next file name to be used

Shows how images download to the computer will be named. To change how files are named, click **Edit...**. The dialog shown at right will be displayed. Using the sample file name as a guide, enter a prefix and suffix and choose the starting number and number of digits for automatic file numbering.




### When a new image is received from camera

Choose the application that will be used to display captured photographs after they are saved to disk.

*Do nothing*
Photographs are not displayed after being saved to the computer hard disk.

*Show it with the Multi Image Window* (Windows XP, Windows 2000, Mac OS X only)
Nikon Capture 4 Editor starts automatically. The destination folder will be opened in the Multi-Image window with the captured image selected in the thumbnail list and displayed in the image area.

*View with Nikon View* (available only if Nikon View is installed)
Nikon Browser and Nikon Viewer start automatically. The destination folder is opened in Nikon Browser with the captured image selected, and the captured image is displayed in Nikon Viewer.

*Show it with the Nikon View Browser* (available only if Nikon View is installed)
Nikon Browser starts automatically. The destination folder is opened in Nikon Browser with the captured image selected.

*Show it in PictureProject* (available only if PictureProject is installed)
PictureProject starts automatically and displays the most recently captured image.

**File Naming Conventions**

**Windows**: *In environments that do not support long file names*, the maximum length is eight characters; file names may not contain spaces, quotes, or any of the following characters: "\\" "/" ":" "." ";" "*" "?" "<" ">" and "|".

*Where long file names are supported*, the maximum length is 255 characters; file names may not contain quotes or any of the following characters: "\\" "/" ":" "." ";" "*" "?" "<" ">" and "|".

**Macintosh**: The maximum length for Macintosh file names is thirty-one characters. Colons (":") are not allowed.

Attach IPTC Information
Check this option to add IPTC information to captured images and enable the **Copy Shooting Data to IPTC Caption** option.

IPTC Information...
Clicking this button displays a dialog where you can select the IPTC information, including keywords and captions, that will be added to images as they are captured.

Copy Shooting Data to IPTC Caption
Check this option to copy shooting data to the caption field of images as they are captured.

After adjusting the above options, click **OK** to exit the dialog and apply settings to subsequent photographs.

## 4 Choose whether to rotate captured images

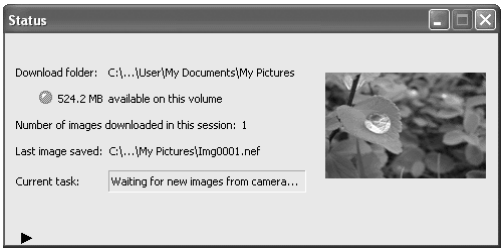
The options in the Nikon Capture 4 Camera Control **Image** menu can be used to rotate captured images according to camera orientation. Use these options when taking photographs in tall ("portrait") orientation (note that these options are not available when **On** or **Automatic** is selected for the auto image rotation option in the D2H or D70 setup menu). Select an option once to enable it, again to disable it.

Rotate all downloaded images by 90 degrees CCW
If this option is checked, images will be rotated 90° counterclockwise as they are saved.

Rotate all downloaded images by 90 degrees CW
If this option is checked, images will be rotated 90° clockwise as they are saved.

## 5 Take pictures

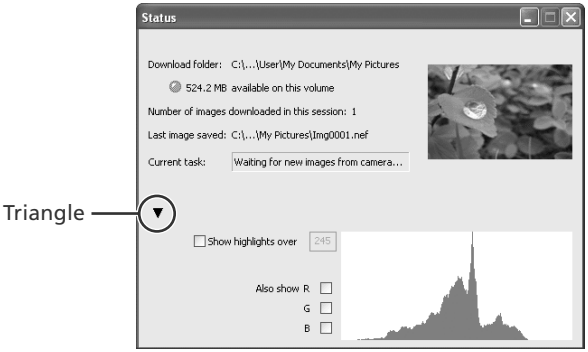
Take pictures using the camera shutter-release button or the **AF and Shoot** or **Shoot** buttons in the Camera Control window. The Status dialog shown below will be displayed.


Status
Download folder: C:\...\User\My Documents\My Pictures
524.2 MB available on this volume
Number of images downloaded in this session: 1
Last image saved: C:\...\My Pictures\Img0001.nef
Current task:
Waiting for new images from camera...

**Auto Image Rotation (D2H and D70 Only)**

If **On** or **Automatic** (the default setting) is selected for the auto image rotation option in the camera setup menu, the D2H and D70 will detect camera orientation and automatically rotate photographs as they are taken (note that in continuous mode, the rotation applied to the first image in each burst applies to all images in the series, even if camera orientation is changed during shooting). If **Off** is selected, all images will be recorded in landscape orientation regardless of how the camera is held. Images can be rotated using the options in the **Image** menu.

To display a histogram of the current image, click the triangle at the bottom of the Status dialog.




If the **Show highlights over** option is checked, any areas of the preview image with a brightness over the value entered in the neighboring text box will be indicated by a flashing border. To display histograms for the red (**R**), green (**G**), and blue (**B**) channels, put a check in the corresponding box.

## 6 Exit Nikon Capture 4 Camera Control

To exit Nikon Capture 4 Camera Control, click the close button in the title bar of the Nikon Capture Camera Control window.

**The Minimize Button (Windows)**

Clicking the minimize button in the Status dialog minimizes Nikon Capture 4 Camera Control.

## Processing Photographs as They Are Captured

As photographs are captured, Nikon Capture 4 Camera Control can automatically process the images to reflect image adjustment settings in Nikon Capture 4 Editor. For information on performing batch processing on images that have already been saved to disk, see "Batch Processing" (88).

Select **Live Batch** from the **Camera** menu. 113

**Open the Live Batch dialog**

Choose how photographs will be processed. 113

Choose the folder that will be used to store the photographs. 114

Choose a naming method and file format for captured photographs. 114

Choose whether to save unmodified photographs separately. 115

Click **Start**. 115

**Open the batch progress dialog**

Take photographs. 115

Finish shooting.

Click **Stop Batch** to exit the Live Batch dialog. 115

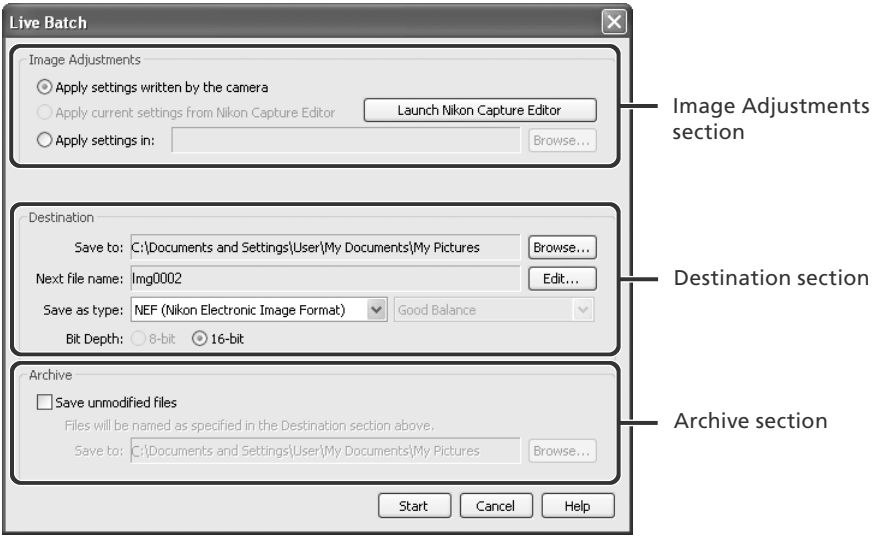
**Close the batch progress dialog**

### Auto Image Rotation (D2H and D70 Only)

If **On** or **Automatic** (the default setting) is selected for the auto image rotation option in the camera setup menu, the D2H and D70 will detect camera orientation and automatically rotate photographs as they are taken (note that in continuous mode, the rotation applied to the first image in each burst applies to all images in the series, even if camera orientation is changed during shooting). If **Off** is selected, all images will be recorded in landscape orientation regardless of how the camera is held. Images can be rotated using the options in the **Image** menu.

## 1 Display the Live Batch dialog

Select **Live Batch** from the **Camera** menu in Nikon Capture 4 Camera Control. The Live Batch dialog will be displayed.




## 2 Specify how captured images will be processed

In the Image Adjustments section, specify the operations to be performed on each image.

### Apply settings written by the camera

Select this option to save images exactly as captured from the camera, without applying any of the modifications in the Nikon Capture 4 Editor tool palettes. The image will be saved in the working (output) color space selected in the Color Management tab of the Preferences dialog (98, 99).

### Apply current settings from Nikon Capture Editor

Select this option to process images using the settings currently in effect in Nikon Capture 4 Editor. This option is only available when Nikon Capture 4 Editor is running.

To open Nikon Capture 4 Editor and adjust settings, click the **Launch Nikon Capture Editor** button.

### Apply settings in

Select this option to process the images using combination settings created using the **Save Selected Adjustments** or **Save All Adjustments** option in the Nikon Capture 4 Editor **Settings** > **Image Adjustment** menu (78; note that if **Calculate Automatically** is selected for white balance in the settings file, the recorded value will be used when images are processed). Click **Browse...** to select a combination settings file.

**Live Batch Processing**

Live batch processing is used to perform the operations specified in the Image Adjustments section of the Live Batch dialog as images are captured from the camera. To ensure that desired results are achieved, we recommend processing a test image before beginning batch processing. Batch processing can not be used to adjust settings separately for each image; instead, the images must be opened one at a time and separate adjustments made manually for each image.

## 3 Choose a destination for captured images

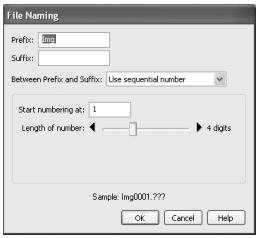
In the Destination section, choose options for saving the processed images.

### Save to

This text box shows the folder to which the images will be saved after processing. To choose a new folder, click the **Browse...** button to the right of the text box and navigate to the desired location.

### Next file name

This text box shows a sample of the file names that will be used when saving the images after processing. To choose a new file name, click the **Edit...** button. The File Naming dialog will be displayed.




### Save as type

Choose the file format that will be used to save the processed images. The following formats are available: **Use source file type**, NEF, TIFF (RGB), TIFF (CMYK), and JPEG. Choose **Use source file type** to save captured images in the format used by the camera. To save images in uncompressed RAW format, set the camera to uncompressed NEF (RAW) and choose **Use source file type**. When NEF is selected, compression can be chosen from a pull-down menu. When JPEG is selected, the compression ratio can be chosen from "Highest Compression Ratio," "Good Compression Ratio," "Good Balance," "Good Quality," and "Excellent Quality." See "Saving Images" (79) for more details.

### Bit depth

Gives the bit depth (the number of bits of color information per channel for each pixel in the image) at which the image will be saved. The 16-bit option is only available if the selected file type is TIFF format (RGB) and the original image has a bit depth of over eight bits.

### File Naming Conventions

**Windows**: *In environments that do not support long file names*, the maximum length is eight characters; file names may not contain spaces, quotes, or any of the following characters: "\\" "/" ":" "." ";" "*" "?" "<" ">" and "|".

*Where long file names are supported*, the maximum length is 255 characters; file names may not contain quotes or any of the following characters: "\\" "/" ":" "." ";" "*" "?" "<" ">" and "|".

**Macintosh**: The maximum length for Macintosh file names is thirty-one characters. Colons (":") are not allowed.

### Error Messages

If an invalid file name or other error is identified in the Live Batch dialog, a message will be displayed. Return to the Live Batch dialog and adjust settings as directed in the message.

## 4 Choose whether to save original photographs

In the Archive section, choose whether to save unprocessed copies of the photographs captured from the camera.

### Save Unmodified Files

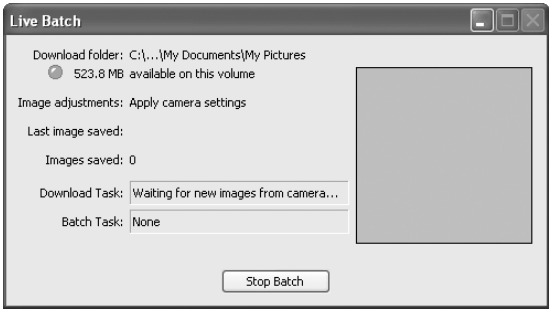
Check this option to save both the original image and copies processed according the options selected in the Image Adjustments section.

### Save to

This text box shows the folder to which unprocessed images will be saved. To choose a new folder, click the **Browse...** button to the right of the text box and navigate to the desired location.

## 5 Click **Start**

Click **Start** to put the selected settings into effect. A progress dialog will be displayed.


Live Batch
Download folder: C:\...\My Documents\My Pictures
523.8 MB available on this volume
Image adjustments: Apply camera settings
Last image saved:
Images saved: 0
Download Task: Waiting for new images from camera...
Batch Task: None
Stop Batch

## 6 Take photographs

Take photographs using the camera shutter-release button.

## 7 End batch processing

Once you have finished taking photographs, click **Stop Batch** to end batch processing. If the Batch Task text box shows that images remain to be processed, a warning will be displayed. Click **Yes** to exit without saving unprocessed images, or **No** to process and save the images before returning to the Nikon Capture 4 Camera Control dialog.

**"Apply Settings Written by Camera" Versus "Save Unmodified Files"**

The **Apply settings written by camera** option saves images in the working (output) color space selected in the Color Management tab of the Preferences dialog (98, 99). The working color space is not applied to images saved using the **Save unmodified files** option.

**The Minimize Button (Windows)**

Clicking the minimize button in the progress dialog minimizes Nikon Capture 4 Camera Control.

**The Warning Button**

If an error occurs during shooting, a warning button will appear at the bottom of the Live Batch dialog. Clicking this button will display a message. End shooting and close the Live Batch dialog as directed. An error log will be displayed; click **OK** to close the log and return to the Camera Control window.

**Stop Batch**

The **Stop Batch** button can only be operated with the mouse.

## Time Lapse Photography

Using Nikon Capture, you can take a series of photographs automatically at a time interval you select.

Select **Time Lapse Photography...** from the **Camera** menu. 116

**Open the Time Lapse Photography dialog**

Choose whether to focus before each shot. 117

Choose the number of photographs to be taken. 117

Choose an interval setting. 117

Choose whether to process photographs automatically. 118

Click **Start** to begin time lapse photography. 118

**Open the time-lapse photography progress dialog**

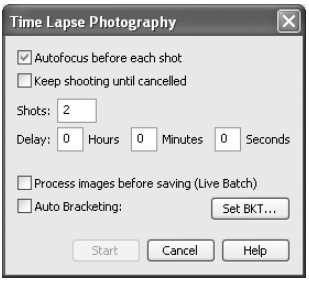
Follow the progress of time lapse photography in the progress dialog. 118

Click **Shooting Complete** to exit the Time Lapse Photography. 118

**Close the time-lapse photography progress dialog**

### 1 Display the Time Lapse Photography dialog

Select **Time Lapse Photography...** from the **Camera** menu. The Time Lapse Photography dialog will be displayed.



## 2 Adjust settings

Before shooting starts, adjust the following settings:

### Autofocus before each shot

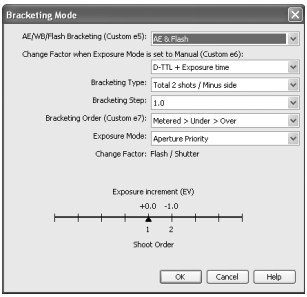
If this option is checked, the camera will perform an autofocus operation before each shot.

### Keep shooting until cancelled

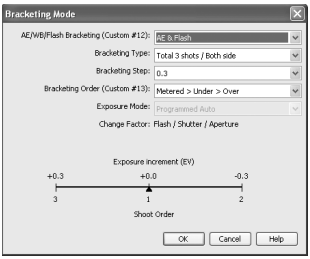
If this option is checked, the camera will continue to take photographs until you click **Stop Shooting** in the Time Lapse Photography dialog (118).

### Auto bracketing (D2H and D70 only)

Select this option to perform exposure, flash, or white balance bracketing during shooting. To change bracketing options, click **Set BKT...**. The dialog shown at right will be displayed.




D2H




D70

*AE/WB/Flash Bracketing*

Choose the type of bracketing performed.

*Change Factor when Exposure Mode is set to Manual* (D2H only)

Choose how bracketing is performed in manual exposure mode.

*Bracketing Type / Bracketing Step / Bracketing Order/Exposure Mode*

Choose the bracketing program, exposure or white balance increment, bracketing order, and exposure mode.

## 3 Specify the number of photographs to be taken

Use the **Shots** box to choose a number of photographs from 2 to 9,999. This option is not available when **Keep shooting until cancelled** is selected.

## 4 Choose an interval setting

The delay between shots can be set to any value between 00:00:01 (one second) and 99:59:59 (ninety-nine hours, fifty-nine minutes, and fifty-nine seconds).

**Time Interval Settings**

If the delay is shorter than the time required to record each photograph, the actual interval between photographs will be longer than that specified in the Time Lapse Photography dialog.

**The Time Lapse Photography Dialog**

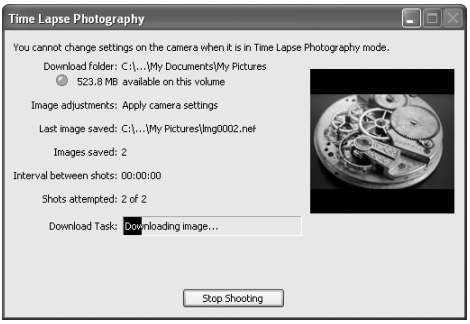
If you make a mistake in entering settings in the Time Lapse Photography dialog, a warning will be displayed. Return to the Time Lapse Photography dialog and adjust settings as directed.

## 5 Click **Start**

Click **Start**. To process images as they are taken, check the **Process images before saving (Live Batch)** option in the Time Lapse Photography dialog and click **Next...**. The Live Batch dialog will be displayed; adjust settings and click **Start** to begin time lapse photography.

## 6 Follow the progress of time lapse photography in the progress dialog

Click **Stop Shooting** to end time lapse photography at any time. If a number of shots was specified in the Time Lapse Photography dialog, shooting will end when the specified number of shots has been taken.


Time Lapse Photography
You cannot change settings on the camera when it is in Time Lapse Photography mode.
Download folder: C:\...\My Documents\My Pictures
523.8 MB available on this volume
Image adjustments: Apply camera settings
Last image saved: C:\...\My Pictures\Img0002.nef
Images saved: 2
Interval between shots: 00:00:00
Shots attempted: 2 of 2
Download Task: Downloading image...
Stop Shooting

## 7 Close the Time Lapse Photography dialog

Once the specified number of shots has been taken, the **Stop Shooting** button will change to **Shooting Complete**. Click **Shooting Complete** to exit the Time Lapse Photography dialog.

### During Time-Lapse Photography

The camera can not be operated during time-lapse photography. No other operations can be performed until the Time Lapse Photography dialog is closed.

### Auto Off (D1-Series Cameras)

When the camera is operated on battery power and **for 15 minutes** has been selected for "While Nikon Capture Camera Control is running, keep camera awake" in the General tab of the Preferences dialog (136), choose a delay of fifteen minutes or less. When taking photographs at longer intervals, use an EH-4 AC adapter (available separately) to power the camera.

### Hard Disk Full

A warning will appear when space is no longer available on the destination disk for photographs taken using time lapse photography. Use the information in the warning to reduce the number of photographs or change the destination drive.

### Error Logs

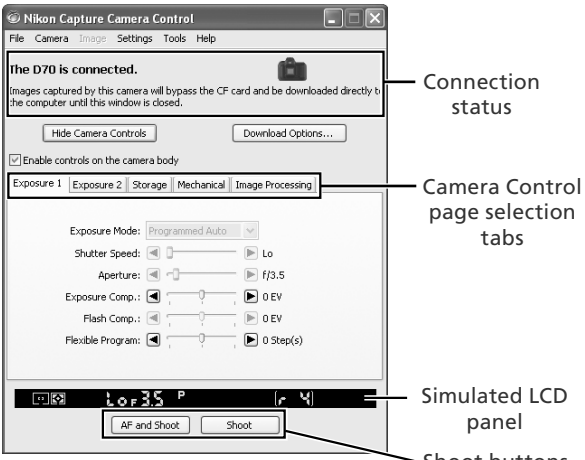
If an error occurs during shooting, an error log will be displayed; click **OK** to close the log and return to the Camera Control window.

### The Minimize Button (Windows)

Clicking the minimize button in the progress dialog minimizes Nikon Capture 4 Camera Control.

## The Nikon Capture 4 Camera Control Window

The Nikon Capture 4 Camera Control window shows current camera settings, which may be viewed by clicking the five page selection tabs. Camera settings can be altered using the controls in each tab as described below. The simulated LCD panel and the **Hide Camera Controls**, **Download Options...**, and shoot buttons can be accessed from all five tabs.


Nikon Capture Camera Control
File Camera Image Settings Tools Help
The D70 is connected.
Images captured by this camera will bypass the CF card and be downloaded directly t
the computer until this window is closed.
Hide Camera Controls
Download Options...
Enable controls on the camera body
Exposure 1 Exposure 2 Storage Mechanical Image Processing
Exposure Mode: Programmed Auto
Shutter Speed: Lo
Aperture: f/3.5
Exposure Comp.: 0 EV
Flash Comp.: 0 EV
Flexible Program: 0 Step(s)
AF and Shoot
Shoot
Connection status
Camera Control page selection tabs
Simulated LCD panel
Shoot buttons

D70

*Connection Status*

This area shows the following information about the camera currently connected:

- Camera name
- Camera orientation (D2H and D70 only)
  If **On** or **Automatic** (the default setting) is selected for the auto image rotation option in the camera setup menu, camera orientation will be indicated by an icon as shown below. No icon will be displayed if **Off** is selected.

Horizontal

Rotated 90° clockwise

Rotated 90 counterclockwise

*Hide Camera Control*

Click this button to hide the Camera Control panels during shooting.

*Download Options*

Click this button to choose a destination and file name for pictures captured from the camera (108).

*Enable controls on the camera body* (D2H and D70 only)

Check this option to enable camera controls, allowing settings to be adjusted and photographs taken directly from the D2H or D70. The camera power switch and AF-area mode selector can not be used when this option is checked; all other controls function normally.

**The Function Dial (D100 Digital Cameras Only)**

The D100 can only be used to take photographs when the function dial is set to **P**, **S**, **A**, or **M**. At other settings, the shoot buttons in the Camera Control dialog will be disabled and the simulated LCD panel will not be displayed.

*Simulated LCD Panel*

This panel shows the information displayed in the camera's viewfinder, with the exception of camera errors. Clicking on an indicator in the panel opens the Nikon Capture 4 Camera Control window to the tab that controls the selected option, where adjustments can be made.

When the D2H or D70 is connected, the amount of memory remaining in the camera memory buffer is displayed at the right edge of the simulated LCD panel. This information is updated at regular intervals, but temporary discrepancies may exist between the display and the actual amount of memory remaining in the buffer.

*Shoot Buttons*

Click either of these buttons to take a photograph at current settings. If a D2H or D70 is connected, photos can be taken in continuous shooting mode (125); in this case, the **AF and Shoot** and **Shoot** buttons will instead be labeled **AF and Start** and **Start**.

AF and Shoot/AF and Start

When this button is clicked, the camera will perform an autofocus and then release the shutter to take a photograph.

Shoot/Start

Click this button to take a photograph. If the selected focus mode is single-servo AF, an autofocus operation will be performed before the shutter is released.

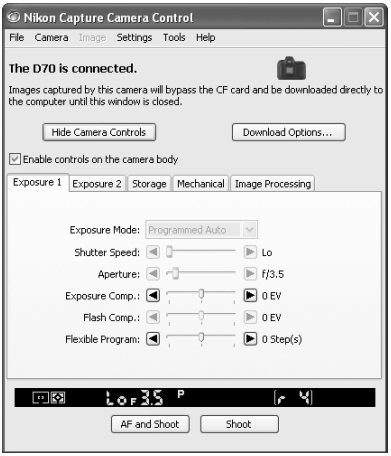
**Camera Settings That Can Not Be Adjusted from Nikon Capture**

The following operations can not be performed from Nikon Capture 4 Camera Control:

| | Operation | Camera |
|---|---|---|
| Status not displayed | Burst photography (continuous shooting mode) | D1-series/D100 |
| | Continuous servo autofocus | D1-series/D2H/D100/D70 |
| | Pressing the shutter-release button halfway to check focus | D1-series/D2H/D100/D70 |
| | Autofocus-only operation (use **AF and Shoot** to perform autofocus) | D1-series/D2H/D100/D70 |
| | Manual aperture adjustment using the lens aperture ring | D1-series/D2H |
| | Reactivating the camera after it has entered sleep mode | D1-series |
| | Depth-of-field preview | D1-series/D2H/D100/D70 |
| | Auto bracketing | D1-series/D100 |
| | Compression options for NEF (RAW) images | D100 |
| | Operation assigned to FUNC. button with Custom Setting f4 | D2H |
| | Remote (D70 only) and self-timer mode selection | D2H/D70 |
| Status displayed | Focus mode | D1-series/D2H/D100/D70 |
| | Metering | D1-series/D100 |
| | Exposure mode (can be adjusted if **Enable controls on camera body** is selected when D70 is connected) | D100/D70 |
| | Shooting mode | D100 |
| | Shutter-speed lock | D1-series/D2H |
| | Aperture lock | D1-series/D2H |
| | Autoexposure lock | D1-series/D2H/D100/D70 |
| | Speedlight flash-level compensation | D2H |
| | M-UP (mirror up) mode selection | D2H |
| | Selection of second center focus area group in group dynamic-AF mode | D2H |

**The Exposure 1 Tab**

The following settings can be adjusted from the Exposure 1 tab:


Nikon Capture Camera Control
File Camera Image Settings Tools Help
The D70 is connected.
Images captured by this camera will bypass the CF card and be downloaded directly to the computer until this window is closed.
Hide Camera Controls
Download Options...
Enable controls on the camera body
Exposure 1
Exposure 2
Storage
Mechanical
Image Processing
Exposure Mode: Programmed Auto
Shutter Speed: Lo
Aperture: f/3.5
Exposure Comp.: 0 EV
Flash Comp.: 0 EV
Flexible Program: 0 Step(s)
AF and Shoot
Shoot

Controls displayed when D70 is connected

*Exposure Mode*

This menu can be used to set the exposure mode for D2H and D1-series cameras. If the D100 or D70 is connected, it will show the current exposure mode, but the exposure mode must be selected using the camera function dial. See the camera manual for details.

*Shutter Speed*

Shutter speed can only be adjusted in **Manual** and **Speed Priority** modes, when it can be set to values between the maximum and minimum values supported by the camera. Use high shutter speeds to freeze motion, low shutter speeds to suggest motion by blurring moving objects.

*Aperture*

Aperture can only be adjusted in **Manual** and **Aperture Priority** modes, when it can be set to values between maximum and minimum aperture (small apertures have high f-numbers, wide apertures low f-numbers; the actual apertures available depend on the lens used). Aperture can not be controlled from Nikon Capture when Custom Setting 22 has been set to allow aperture to be adjusted manually using the lens aperture ring (D1-series only).

*Exposure Comp.*

Exposure compensation is useful when shooting subjects containing sharp lighting contrasts, or on other occasions when you want to modify the exposure value determined by the camera. Exposure compensation is available in all exposure modes.

*Flash Comp.* (D100 and D70 only)

This option is used to adjust the level of the camera's built-in Speedlight.

*Flexible Program*

Flexible program can only be used in Program Mode, when it allows you to choose from predetermined combinations of shutter speed and aperture appropriate to current lighting conditions.

**The Function Dial (D100 Digital Cameras Only)**

The D100 can only be used to take photographs when the function dial is set to **P**, **S**, **A**, or **M**. At other settings, the controls in the Exposure 1 tab will be disabled.

**Non-CPU Lenses**

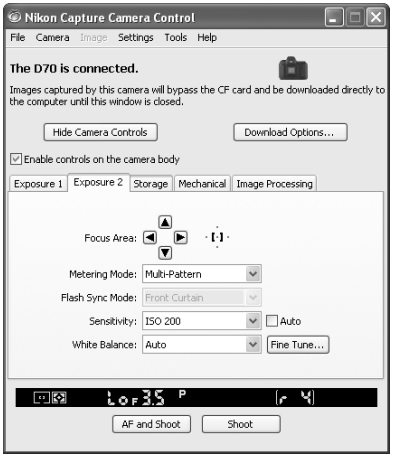
See page 127 for information on the settings available with non-CPU lenses.

**Bulb**

At a shutter speed of Bulb, the shutter remains while the shutter release button is held down. Use the camera shutter-release button to take photos at this setting. Clicking either of the shoot buttons will display an error message.

**The Exposure 2 Tab**

The following settings can be adjusted from the Exposure 2 tab.




Controls displayed when D70 is connected

*Focus Area*

The focus area can be selected using the arrow buttons. D1-series, D100 and D70 cameras offer a choice of five focus areas, the D2H eleven. In group dynamic-AF area mode (D2H only) the selected focus-area group is displayed (the groupings used are determined by the option selected for Custom Setting a3, **Group dynamic AF**). See the camera manual for details. For information on AF-area mode and focus mode, see "The Mechanical Tab" (126).

*Metering Mode*

The metering mode can be selected from this menu (D2H and D70 only). Metering mode defaults to the option selected with the camera. If a D1-series or D100 camera is connected, or if **Enable controls on the camera body** is checked when a D2H is connected, the current metering mode will be shown, but changes can only be made using camera controls. See the camera manual for details.

*Flash Sync Mode*

This option controls the camera flash sync mode.

*Sensitivity*

Sensitivity (ISO equivalency) can be raised when taking photographs in low light conditions. See the user's manual provided with your camera for details.

*Auto* (D2H/D100/D70 only)

When this option is checked, the camera will adjust sensitivity (ISO equivalency) automatically (ISO auto).

*White Balance*
White balance is used to ensure that colors which appear white when viewed directly are white in the final photograph. See the camera manual for details.

*Fine Tune.../Set Temp...*
Click **Fine Tune...** to make fine adjustments to white balance (130). If **Choose color temp.** is selected (D2H only), this button will be labeled **Set temp...**. Click this button to choose a color temperature (130). Fine tuning is not available with preset white balance.

*Comment* (D2H only)
This field lists the comments for all white balance presets.

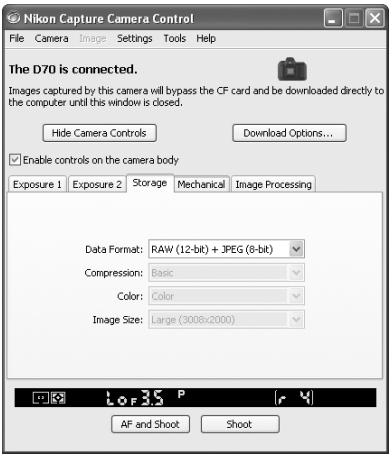
*Edit...* (D2H only)
This button is only available when **Preset** is selected for white balance. Clicking **Edit...** displays the dialog shown at right, where the comments for each of the white balance presets can be edited. After entering descriptive comments of up to thirty-six characters each, click **OK** to copy the comments to the camera.

**Comments (D2H Only)**
In addition to letters and numbers, comments can contain quotes, apostrophes, spaces, and any of the following characters: "," "." "!" "?" "#" "$" "%" "&" "(" ")" "[" "]" "{" "}" "*" "+" "-" "/" ":" ";" "<" "=" ">" "_" and "@".

**White Balance**
If desired, white balance can be used to produce an intentionally unbalanced rendering of a scene.

**The Storage Tab**

The following settings can be adjusted from the Storage tab:


Nikon Capture Camera Control
File Camera Image Settings Tools Help
The D70 is connected.
Images captured by this camera will bypass the CF card and be downloaded directly to the computer until this window is closed.
Hide Camera Controls
Download Options...
Enable controls on the camera body
Exposure 1 Exposure 2 Storage Mechanical Image Processing
Data Format: RAW (12-bit) + JPEG (8-bit)
Compression: Basic
Color: Color
Image Size: Large (3008x2000)
AF and Shoot
Shoot

Controls displayed when D70 is connected

*Data Format*

The following data formats are available: **RAW (12-bit) + JPEG (8-bit)** (D2H/D70 only), **RAW (12-bit)**, **TIFF-RGB (8-bit)** (D1-series/D2H/D100 only), **TIFF-YCbCr (8-bit)** (D1-series only), and **JPEG (8-bit)**. This setting determines pixel bit depth and file size.

*Compression*

When data format is set to **JPEG (8-bit)**, you can choose the image quality (JPEG compression) setting from **Fine**, **Normal**, and **Basic**. When **RAW (12-bit) + JPEG (8-bit)** is selected with the D2H, image quality can be selected from **Fine**, **Normal**, and **Basic**. When **RAW (12-bit) + JPEG (8-bit)** is selected with the D70, image quality is fixed at **Basic**.

*Color*

Choose from **Color** and **Black & White** (D1-series only). **Black & White** is not available with the D2H, D100, or D70 or when **RAW** is selected for **Data Format**.

*Image Size*

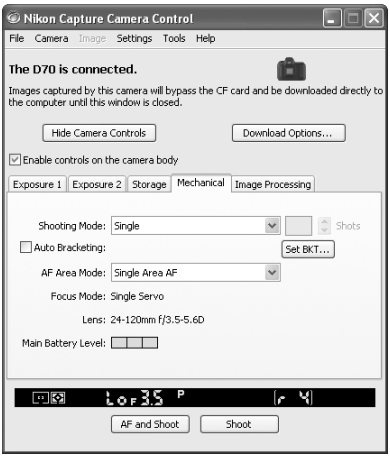
Choose image size. See the camera manual for details.

*RAW Compression* (D2H/D1x/D1h only)

Check this option to compress NEF (RAW) images taken at a data format setting of **RAW (12-bit) + JPEG (8-bit)** (D2H only) or **RAW (12-bit)**.

**The Mechanical Tab**

The following settings can be adjusted from the Mechanical tab:


Nikon Capture Camera Control
File Camera Image Settings Tools Help
The D70 is connected.
Images captured by this camera will bypass the CF card and be downloaded directly to the computer until this window is closed.
Hide Camera Controls
Download Options...
Enable controls on the camera body
Exposure 1 Exposure 2 Storage Mechanical Image Processing
Shooting Mode: Single
Shots
Auto Bracketing:
Set BKT...
AF Area Mode: Single Area AF
Focus Mode: Single Servo
Lens: 24-120mm f/3.5-5.6D
Main Battery Level:
AF and Shoot
Shoot

Controls displayed when D70 is connected

*Shooting Mode*

Sets the shooting mode for D1-series cameras connected in PC mode to **Single** or **Continuous**. Changes to this setting also apply to Custom Setting 30. Unless **Enable controls on the camera body** is checked in the connection status area, the shooting mode for the D70 can be selected from **Single** and **Continuous**, while the shooting mode for D2H cameras can be selected from **Single**, **Continuous low speed**, and **Continuous high speed**. If **Continuous** is selected for the D70 or if **Continuous low speed** or **Continuous high speed** is selected for the D2H, the **AF and Shoot** and **Shoot** buttons will instead be labeled **AF and Start** and **Start**. If **Enable controls on the camera body** is checked or a D100 camera is connected, the current shooting mode will be shown, but changes can only be made using camera controls. See the camera manual for details.

**Self-Timer and Remote Modes**

When the D2H, D70, or D100 is set to self-timer mode, or when the D70 is set to delayed remote or quick-response remote mode, the Mechanical tab will show a shooting mode of **Single**, and any photographs taken with the Nikon Capture 4 Camera Control shoot buttons will be taken in single-frame mode with no shutter-release delay. To take pictures in self-timer or remote mode, use the shutter-release button on the camera.

**Continuous Mode (D2H/D70 Cameras Only)**

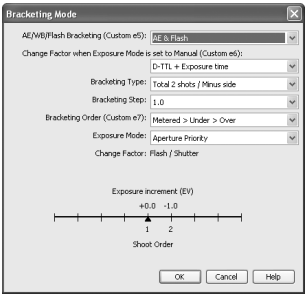
When the D2H or D70 is connected, the amount of memory remaining in the camera memory buffer is displayed at the right edge of the simulated LCD panel. This information is updated at regular intervals, but temporary discrepancies may exist between the display and the actual amount of memory remaining in the buffer.

**Taking Photographs in Continuous Mode (D100/D1-Series Only)**

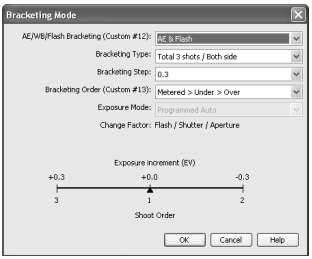
When a D100 is connected or a D1-series camera is in PC mode, continuous shooting can only be performed using the camera shutter-release button. The shoot buttons in the camera control window can only be used to take one photograph at a time.

*Maximum Shots* (D2H and D70 Only)
Use the arrows to choose the maximum number of shots that can be taken in a single burst in continuous mode, or enter a value directly in the text box. The maximum permitted value varies with the current image-quality setting; the value chosen should not, however, exceed the capacity of the camera memory buffer as shown at the right edge of the LCD display. Values larger than the capacity of the camera memory buffer will be shown in red. This setting only applies when the camera is connected, and differs from the maximum selected in the Custom Settings menu.

*Auto Bracketing* (D2H and D70 only)
Select this option to perform exposure, flash, or white balance bracketing during shooting. To change bracketing options, click **Set BKT**. The dialog shown at right will be displayed.




D2H




D70

### AE/WB/Flash Bracketing
Choose the type of bracketing performed.

### Change Factor when Exposure Mode is set to Manual *(D2H only)*
Choose how bracketing is performed in manual exposure mode.

### Bracketing Type/Bracketing Step/ Bracketing Order/Exposure Mode
Choose the bracketing program, exposure or white balance increment, bracketing order, and exposure mode.

*AF Area Mode*
Choose the AF-area mode. If **Enable controls on the camera body** is checked (D2H and D70 only), the current AF-area mode will be shown, but changes can only be made using camera controls. See the camera manual for details.

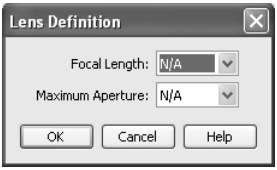
*Focus Mode*
The current focus mode setting is displayed. See the camera manual for details. This setting can not be changed from Nikon Capture.

*Lens*

Displays the focal length and maximum aperture of the lens currently attached to the camera. Depending on the lens type, some information may not be displayed. If the lens focal length or maximum aperture have been specified manually (see below), an asterisk will appear next to these values.

*Edit...* (D2H only)

This button is only available when a non-CPU lens is mounted on the camera. Clicking **Edit...** displays the dialog shown at right, where the lens focal length and maximum aperture can be entered. Click **OK** to copy the values to the camera.




*Main Battery Level*

Displays the level of the main camera battery. Green indicates that the battery has enough charge for continued operation. Yellow indicates that battery level is low; ready a fully charged spare battery pack. Red indicates that the battery is exhausted, and that no further photographs can be taken until the battery pack has been replaced. You may not be able to control the camera from Nikon Capture when the battery is exhausted. Replace with a fully charged spare battery pack or use an AC adapter (available separately).

*Clock Battery Level* (D1-series only)

Displays the level of the camera clock battery. Should this display turn yellow or red, have the clock battery replaced by an authorized Nikon service representative (a fee is charged for this service).

**Non-CPU Lenses**

The following restrictions apply to Nikon Capture 4 Camera Control when a non-CPU lens is mounted on the camera (the operations listed can still be performed using the controls on the camera body; see the camera manual for details):

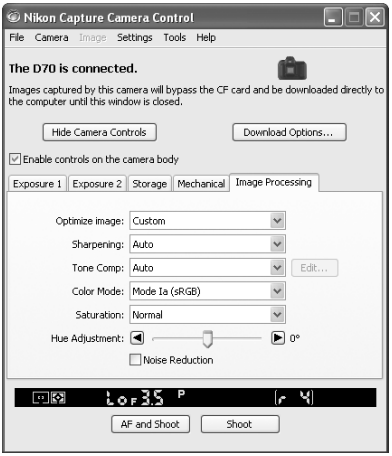
| | D1-series | D100 | D2H | | D70 |
|---|---|---|---|---|---|
| | | | Lens data specified | Lens data not specified | |
| **Exposure Mode** | Can be selected from **Aperture-priority auto** and **Manual**. | Can not be adjusted. Mode selected with camera displayed.* | Can be selected from **Aperture-priority auto** and **Manual**. | | Can only be adjusted if **Enable controls on the camera body** is not checked. Otherwise mode selected with camera is displayed. Photos can only be taken in mode M.* |
| **Shutter Speed** | Can only be adjusted in manual exposure mode. | | | | |
| **Aperture** | Aperture shown as "f/--". Can not be adjusted. | | Asterisk appears next to selected aperture. | Aperture shown as "f/--". Can not be adjusted. | |
| **AF and Shoot** | Can not be used. | | | | |
| **Shoot** | Can be used.† | | | | |

* When non-CPU lens is attached, photos can only be taken in mode M.

† If D100 or D70 is connected and set to an exposure mode other than manual, a warning will be displayed.

### The Image Processing Tab

The following settings can be adjusted from the Image Processing tab:


Nikon Capture Camera Control
File Camera Image Settings Tools Help
The D70 is connected.
Images captured by this camera will bypass the CF card and be downloaded directly to the computer until this window is closed.
Hide Camera Controls
Download Options...
Enable controls on the camera body
Exposure 1 Exposure 2 Storage Mechanical Image Processing
Optimize image: Custom
Sharpening: Auto
Tone Comp: Auto
Edit...
Color Mode: Mode Ia (sRGB)
Saturation: Normal
Hue Adjustment: 0°
Noise Reduction
AF and Shoot
Shoot

Controls displayed when D70 is connected

*Image Optimize image* (D70 only)
This setting controls the type of image optimization performed. See the camera manual for details.

*Sharpening*
This option controls how much the camera sharpens outlines. See the camera manual for details.

*Tone Comp*
This setting controls contrast. See the camera manual for details.

*Color Mode* (D1x, D1H, D2H, D100, and D70 only)
The D1X, D1H, D2H and D70 offer a choice of color modes. See the camera manual for details. With the D1, colors are optimized for the NTSC color space, regardless of the option chosen for color mode.

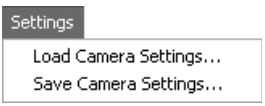
*Saturation* **(**D70 only)
Choose a setting for color saturation. See the camera manual for details.

*Hue Adjustment* (D1x, D1H, D2H, D100, and D70 only)
Use to modify hue while leaving brightness and chroma unaffected. Adjustments can be made in the range –9° to 9°, with 0° representing the original hues as recorded by the camera (in D1-series cameras, –9° is equivalent to a camera hue setting of 0, 0° to a setting of 3, and 9° to a setting of 6).

*Noise Reduction* (D2H, D100, and D70 only)
At slow shutter speeds, "noise" in the form of randomly-spaced, brightly-colored pixels may appear in photographs, particularly in shadows. Check Noise Reduction to reduce noise.

### Saving and Loading Camera Control Settings

The Camera Control option in the **Settings** menu is used to save Nikon Capture 4 Camera Control settings and to load and apply previously saved settings.




| Option | Description |
|---|---|
| **Load Camera Settings...** | Select this item to load camera settings previously saved using the **Save Camera Settings...** option (see below). A dialog will be displayed where you can navigate to the drive (volume) and directory containing the desired settings file (only files with the extension ".ncc" will be displayed). The settings in the Camera Control window will instantly revert to the saved settings. |
| **Save Camera Settings...** | Select this item to save the settings in the Camera Control window to a named file. These settings can later be recalled using the **Load Camera Settings...** option. Choosing **Save Camera Settings...** displays a dialog where you can choose a destination and file name for current camera settings. Camera settings are saved with the extension ".ncc". |

**The Camera Menu**

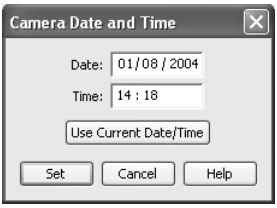
The commands in the **Camera** menu are used to adjust the following camera settings:

*Custom Settings...*

Selecting this option opens the Custom Settings dialog (132), where camera Custom Settings can be adjusted.

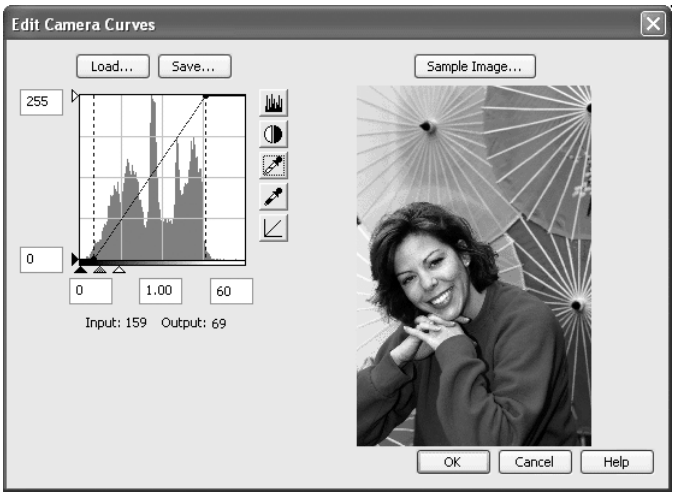
*Set Date and Time...*

Selecting this option opens the dialog shown at right, where you can set the camera's clock calendar to the current date and time. To view the current time and date settings, click **Use Current Date/Time**. Click **Set** to set the clock calendar to the time and date shown.




*Edit Camera Curves...*

This option is used to create a custom tone compensation curve and download it to the camera, where it applies when "Custom" is selected for the camera tone compensation option.



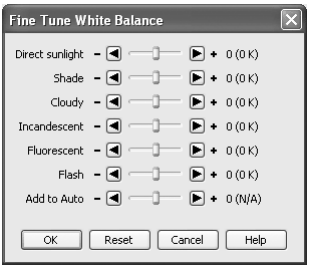

The controls in the Edit Camera Curves window are identical to those in the Curves window, except in the following respects: (1) only the master channel, not individual RGB channels, may be edited; (2) there is a limit of 20 spline points; (3) the midpoint may not be edited; (4) a user-defined sample image can be selected by clicking **Sample Image...** (the sample image must be a RAW image created with a D1-series, D2H, D100, or D70 camera). Any changes to curves are reflected in the sample image. To copy the edited curve to the camera, click **OK**.

The upper left section of the Edit Camera Curves window contains **Load...** and **Save...** buttons. By clicking the **Load...** button, previously stored curves, with less than 20 spline points, can be selected via the "Open" dialog (if the selected file has more than 20 spline points, a warning will be displayed, and no file will be loaded). Look for files with the ".ntc" extension.

The **Save...** button opens the "Save As" dialog, where you can save the current curve.

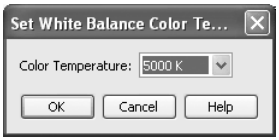
*Fine-Tune White Balance...*

Selecting this option displays the dialog shown at right, where white balance can be fine-tuned between –3 and +3. The value selected for **Add to Auto** will be added to the white balance setting the camera chooses for auto white balance. Clicking **Reset** returns all values to defaults. Click **OK** to apply the current settings to the camera, or click **Cancel** to discard any changes and return to the Nikon Capture 4 Camera Control window.



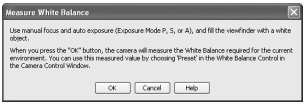

*Set Color Temperature...* (D2H only)

Selecting this option displays the dialog shown at right, where color temperature can be chosen from a menu. The value chosen takes effect whenever **Choose color temp.** is selected for white balance. Click **OK** to apply the current settings to the camera, or click **Cancel** to exit without saving changes.

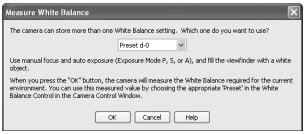



*Measure White Balance...*

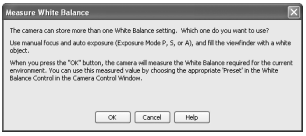
Use this option to measure preset white balance. If the camera currently connected supports multiple values for preset white balance, the setting that will be used to store the measured value can be chosen from the pop-up menu at the top of the dialog. Adjust camera settings as described in the section on preset white balance in the camera user's manual and click **OK** to measure a value for white balance.



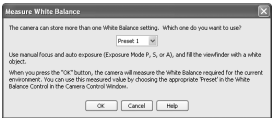

D1/D100




D2H



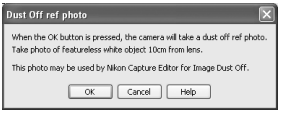

D70




D1x/D1h

*Dust Off Ref Photo* (D2H and D70 only)

Choose this option to take a reference photo for Image Dust Off. The dialog shown at right will be displayed. With the camera lens ten centimeters (four inches) from a featureless white object, frame the object so that it fills the viewfinder and click **OK** to record an Image Dust Off reference photo. See the camera manual for details.


Dust Off ref photo
When the OK button is pressed, the camera will take a dust off ref photo. Take photo of featureless white object 10cm from lens.
This photo may be used by Nikon Capture Editor for Image Dust Off.
OK
Cancel
Help

**Choosing a Mode (D100 and D70 Only)**

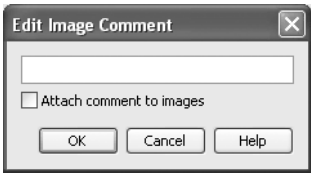
The **Measure White Balance...** option is only available in **P**, **S**, **A**, and **M** modes.

**Set Color Temperature... (D2H Cameras Only)**

The desired results may not be achieved with flash or fluorescent lighting.

*Edit Image Comment...*
Selecting this option displays the dialog shown at right, where you can enter a comment or title for subsequent photographs. If the camera currently connected is in the D1-series, enter a title of thirty-eight characters or less and click **OK**. The title will be used for all subsequent photographs taken while the camera is connected. When a D2H, D100, or D70 camera is connected, the title is stored in the camera as an image comment of thirty-six characters or less which is appended to photographs only when the **Attach comment to images** box is checked.

D1-series

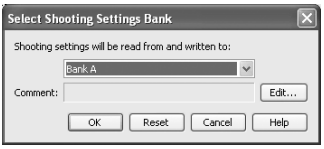


D2H/D100/D70

*Select Shooting Settings Bank...* (D2H and D100 only)
Selecting this option displays the dialog shown at right, where you can choose the shooting menu bank in which changes to settings will be stored while the camera is controlled from Nikon Capture 4 Camera Control. See the camera manual for details.

D100

The D2H allows a descriptive comment to be added to the name of each shooting menu bank. Clicking **Edit...** displays the dialog shown at right, where the comments for each bank can be edited. After entering descriptive comments of up to twenty characters each, click **OK** to copy the comments to the camera.



D2H

Edit Comment dialog

*Set Bracketing Mode* (D2H and D70 only)
Selecting this option displays the BKT Mode dialog. See **Auto Bracketing** in the Mechanical panel for details (126).

*Live Batch...*
Selecting this option opens the Live Batch dialog (112).

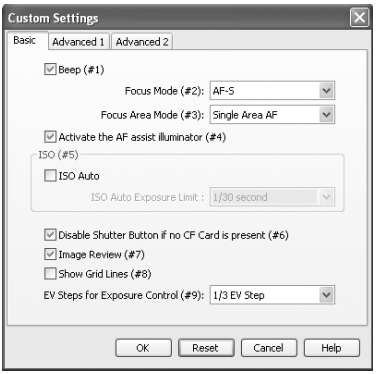
*Time Lapse Photography...*
Selecting this option opens the Time Lapse Photography dialog (116).

**Comments for Shooting Menu Banks (D2H Only)**
In addition to letters and numbers, comments can contain quotes, apostrophes, spaces, and any of the following characters: "," "." "!" "?" "#" "$" "%" "&" "(" ")" "[" "]" "{" "}" "*" "+" "-" "/" ":" ";" "<" "=" ">" "_" and "@".

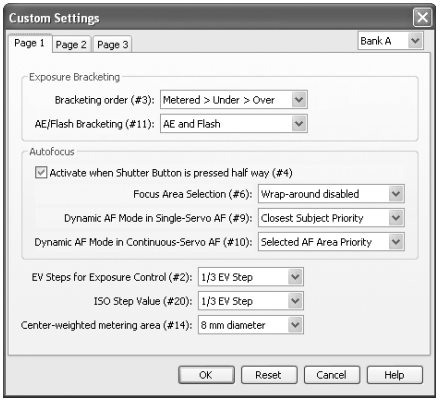
## Custom Settings

Most of the custom settings stored in camera memory can be viewed and adjusted from the Custom Settings window in Nikon Capture 4 Camera Control. For more information on Custom Settings, see the documentation provided with your camera.

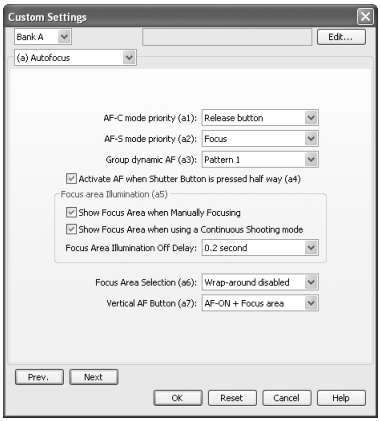
**1** Select **Custom Settings...** from the **Camera** menu
The Custom Settings dialog will be displayed.




D70


Custom Settings
Page 1
Page 2
Page 3
Bank A
Exposure Bracketing
Bracketing order (#3): Metered > Under > Over
AE/Flash Bracketing (#11): AE and Flash
Autofocus
Activate when Shutter Button is pressed half way (#4)
Focus Area Selection (#6): Wrap-around disabled
Dynamic AF Mode in Single-Servo AF (#9): Closest Subject Priority
Dynamic AF Mode in Continuous-Servo AF (#10): Selected AF Area Priority
EV Steps for Exposure Control (#2): 1/3 EV Step
ISO Step Value (#20): 1/3 EV Step
Center-weighted metering area (#14): 8 mm diameter
OK
Reset
Cancel
Help

D1-series/D100 cameras
(illustration shows settings for D1x)


Custom Settings
Bank A
Edit...
(a) Autofocus
AF-C mode priority (a1): Release button
AF-S mode priority (a2): Focus
Group dynamic AF (a3): Pattern 1
Activate AF when Shutter Button is pressed half way (a4)
Focus area Illumination (a5)
Show Focus Area when Manually Focusing
Show Focus Area when using a Continuous Shooting mode
Focus Area Illumination Off Delay: 0.2 second
Focus Area Selection (a6): Wrap-around disabled
Vertical AF Button (a7): AF-ON + Focus area
Prev.
Next
OK
Reset
Cancel
Help

D2H

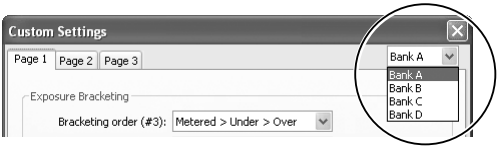
The Custom Settings dialog shows the Custom Settings currently in effect.

### Changes to Custom Settings

Changes made to settings in the Custom Settings dialog are stored in the camera, not on the computer hard disk. This means that changing settings in the Custom Settings dialog has the same effect as changing Custom Settings using camera controls.

## 2 Choose a Custom Settings bank

Choose a Custom Settings bank (Custom Settings set) from the pop-up menu at the top right corner or the Custom Settings dialog.




The banks available depend on the model of camera currently connected. When the D1 or D100 is connected, you have a choice of banks A or B; when the D1X, D1H, or D2H is connected, banks A, B, C, or D can be selected.

## 3 Click **OK**

After making any changes to Custom Settings, click **OK** to save changes in the camera Custom Settings bank and exit the Custom Settings dialog.

### Custom Settings

Custom Settings can not be saved to a separate file. Clicking the Reset button resets all Custom Settings to their default values.

### Settings That Can Not Be Adjusted from the Custom Settings Window

The Custom Settings listed below can not be adjusted in the Custom Settings window.

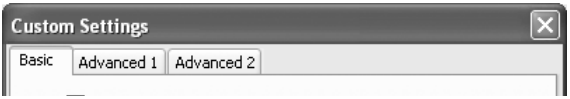
- Mirror lock-up for CCD cleaning (D1-series Custom Setting 8)/Cleaning mirror up (D100 setup menu): can only be adjusted from the camera
- RAW (NEF) image save (D1-series Custom Setting 28): if this option is set to "0" (off) when Nikon Capture is started, a message will be displayed. Clicking OK in this dialog sets Custom Setting 28 to "1" (uncompressed RAW image save enabled). Custom Setting 28 can only be returned to "0" from the camera.
- ISO Auto (D100 Custom Setting 3)/ISO Boost (D1-series Custom Setting 31): can be adjusted from the Exposure 2 tab of the Camera Control window.
- PC Shooting Mode (D1-series Custom Setting 30): this option is adjusted from the Mechanical tab of the Camera Control window.
- Tone Compensation (D1-series Custom Setting 24)/Color Mode (D1X/D1H Custom Setting 32)/Hue Adjustment (D1X/D1H Custom Setting 33)/Noise Reduction (D100 Custom Setting 4): can be adjusted from the Processing tab of the Camera Control window.

### Custom Settings for D1-Series and D100 Cameras

Custom Settings for D1-series and D100 cameras are divided among three tabs: Page 1, Page 2, and Page 3. See the camera manual for details.

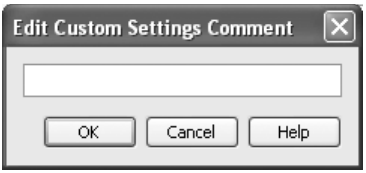
### Custom Settings for D70 Cameras

Custom Settings for the D70 are divided among three tabs: Basic, Advanced 1, and Advanced 2. See the camera manual for details.

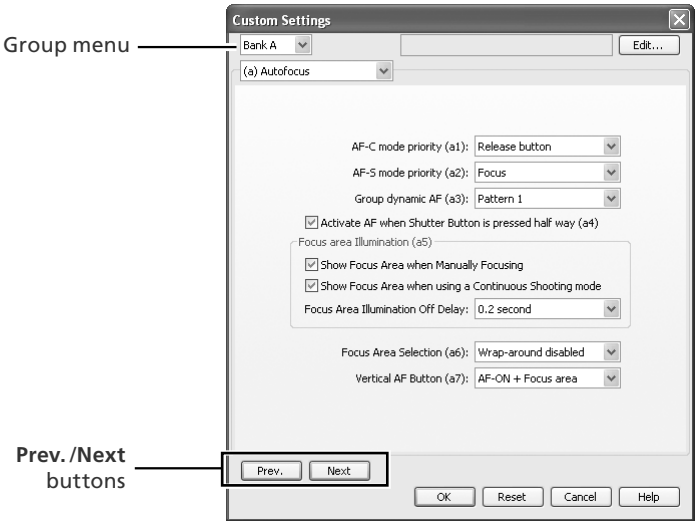



### Custom Settings for D2H Cameras

The D2H allows a descriptive comment to be added to the name of each Custom Settings bank. Clicking **Edit...** displays the dialog shown at right, where the comments for each bank can be edited. After entering descriptive comments of up to twenty characters each, click **OK** to copy the comments to the camera.




Custom Settings in each bank are divided into six groups: autofocus, metering/exposure, timers/autoexposure and autofocus lock, shooting/display, bracketing/flash, and controls. The group can be chosen from the group menu or by clicking the **Next** and **Prev.** buttons.




**Comments (D2H Only)**

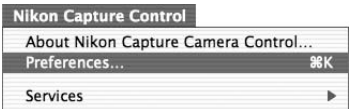
In addition to letters and numbers, comments can contain quotes, apostrophes, spaces, and any of the following characters: "," "." "!" "?" "#" "$" "%" "&" "(" ")" "[" "]" "{" "}" "*" "+" "-" "/" ":" ";" "<" "=" ">" "_" and "@".

# Nikon Capture 4 Camera Control Preferences

*Fine-Tuning Nikon Capture 4 Camera Control*

To view the Preferences dialog for Nikon Capture 4 Camera Control, select **Options...** from the **Tools** menu (Windows) or select **Preferences...** from the application menu (Mac OS X) or **Edit** menu (Mac OS 9).

Windows




Mac OS X

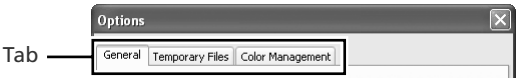
The Preferences dialog contains the following three tabs:

| Tab | Description | |
|---|---|---|
| General | Choose the length of time the camera remains active when no operations are performed. | 136 |
| Temporary Files | Specify the location of the folders used for temporary storage. | 137 |
| Color Management | Select the color profiles used by the Nikon Color Management System (CMS). | 137 |

After making changes to preferences, click **OK** to save changes and return to the Nikon Capture 4 Camera Control window. Click **Cancel** to cancel any changes to settings and return to the Nikon Capture 4 Camera Control window.

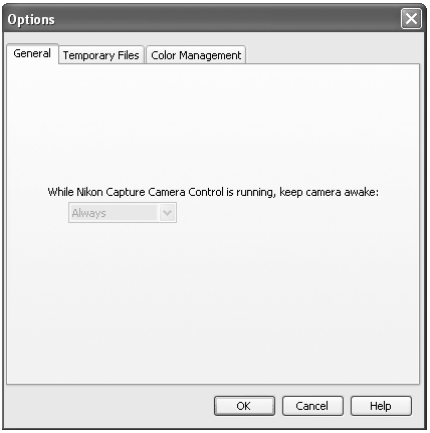
### Viewing Preferences

To view settings in any of the three panels, click the appropriate tab.



## The General Tab

The General tab contains the following items:




*While Nikon Capture Camera Control is running, keep camera awake*

Set the length of time before exposure meters turn off automatically when the camera is running on battery power. This setting only takes effect when the camera is connected and powered on, and only when Nikon Capture 4 Camera Control is running. This setting takes precedence over the auto meter off option chosen using camera Custom Settings. The D2H, D100, and D70 will stay awake indefinitely, regardless of the setting chosen here.

for 15 minutes (D1-series only)
The time before exposure meters turn off automatically is set to fifteen minutes.

Always
The camera stays awake indefinitely. Note that this will increase the drain on the battery.

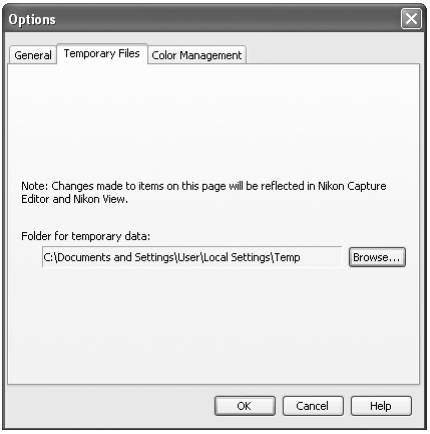
When powered by an AC adapter (available separately), the camera stays awake indefinitely, regardless of the setting chosen using the above option.

## The Temporary Files Tab

The Temporary Files tab contains the following item:

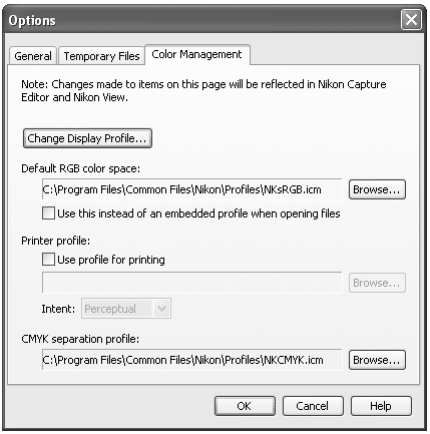
*Folder for temporary data*

Specify the folder or volume in which temporary data, such as image cache data, will be stored. The default folder for Windows is the "TEMP" folder in the Windows directory, while the default volume for the Macintosh is the start-up disk. To choose a different folder in the Windows version of the program, click the **Browse...** button and navigate to the desired location. In the Macintosh version, a new volume can be chosen from the pop-up menu.

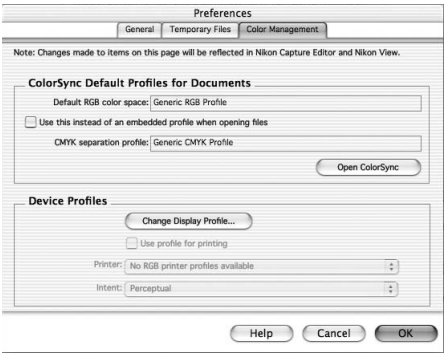



## The Color Management Tab

For more information on the Color Management tab, see "Nikon Capture 4 Editor Preferences" (98, 99).




Windows




Macintosh

### Folder for Temporary Data

The folder chosen for temporary storage in the Temporary Files tab also applies to Nikon Capture 4 Editor. Changes will only take effect after the program has been restarted.

### The Color Management Tab

Changes to settings in the Color Management tab also apply to Nikon Browser, Nikon Viewer, and Nikon Capture 4 Editor.

# Appendices

*Technical Notes*

The appendices cover the following topics.

*Appendix A: Supported Color Profiles*
Read this section for a description of the RGB color-space profiles supported under Nikon Capture 4.

*Appendix B: Color Matching in Adobe Photoshop (Version 7.0 or later)*
Learn how to preserve color-space profile information when opening images in Adobe Photoshop (version 7.0 or later).

*Appendix C: Troubleshooting*
Read this section for information on what to do when Nikon Capture 4 does not function as expected.

*Appendix D: Glossary*
Refer to this section when you are unsure of the meanings of the terms used in this manual.

# Appendix A

*Supported Color Profiles*

## 1. Standard RGB Profiles Supported in Nikon Capture 4

### 1.1 Profiles with a Gamma Value of 1.8

*Apple RGB (Nikon Apple RGB 4.0.0.3000)*
This profile is used in desk-top publishing applications and in Adobe Photoshop versions 4.0 or earlier, and is the typical RGB profile for Macintosh monitors. The corresponding RGB setting in Adobe Photoshop is "Apple RGB." This profile is suitable for working with images displayed on the Macintosh.

*ColorMatch RGB (Nikon ColorMatch RGB 4.0.0.3000)*
The ColorMatch profile is native to Radius PressView monitors. It has a wider gamut than Apple RGB, with a particularly wide area devoted to the reproduction of blues. The corresponding RGB setting in Adobe Photoshop is "Color Match RGB."

### 1.2 Profiles with a Gamma Value of 2.2

*sRGB (Nikon sRGB 4.0.0.3000)*
This RGB profile is used in the majority of Windows monitors. It closely resembles the RGB commonly used in color television, and is also used in the digital television broadcasting system that is on its way to becoming the industry standard in the United States of America. Software and hardware manufacturers use it as a default color profile and guarantee operation when it used. It is also on its way to becoming the standard for images on the web. This profile is suited to users who plan to use their digital images "as is," without editing or printing them. It however suffers from the drawback of a narrow gamut with a limited area available for reproducing blues. The corresponding RGB setting in Adobe Photoshop 5.0 and 5.5 is "sRGB," the corresponding setting in Adobe Photoshop 6.0 "sRGB IWC61966-2.1."

*Bruce RGB (Nikon Bruce RGB 4.0.0.3000)*
This color profile attempts to expand on the ColorMatch RGB gamut by defining the chromaticity for G as lying between the values for G in the Adobe RGB and ColorMatch color-space profiles. It was proposed by Bruce Fraser, who claims that it includes most of the colors in the SWOP CMYK gamut. The R and B used in the Bruce RGB and Adobe RGB color-space profiles match.

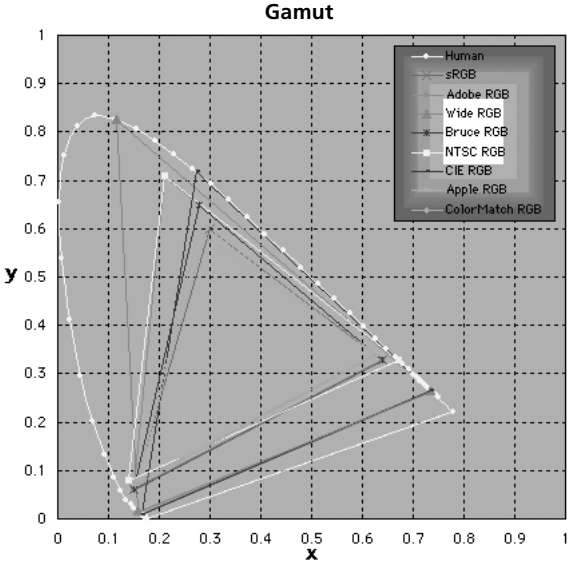
*NTSC (1953) (Nikon NTSC (1953) 4.0.0.3000)*
This is the color space for video defined by the National Television Standards Committee (NTSC) in 1953 and used in early color televisions. This color space is also used in some Far-East newspaper and printing organizations. The corresponding RGB setting in Adobe Photoshop is "NTSC (1953)."

*Adobe RGB (1998) (Nikon Adobe RGB (1998) 4.0.0.3000)*
A color-space profile defined in Adobe Photoshop 5.0. It has a wider gamut than sRGB and includes the colors found in most CMYK gamuts, making it suitable for users involved in desktop publishing. The corresponding RGB setting in Adobe Photoshop 5.0 is "SMPTE-240M," the corresponding setting in Adobe Photoshop 5.5 or later "Adobe RGB (1998)."

*CIE RGB (Nikon CIE RGB 4.0.0.3000)*
A video color-space profile established by the Commission Internationale de l'Éclairage (CIE). While it boasts a fairly wide gamut, it suffers from the drawback that the area devoted to the reproduction of cyan is relatively small. The corresponding RGB setting in Adobe Photoshop is "CIE RGB."

*Adobe Wide RGB (Nikon Adobe Wide RGB 4.0.0.3000)*
This color-space profile, designed by Adobe, incorporates most of the visible colors. This however has the consequence that most of the colors it can express can not be reproduced on standard monitors and printers. The corresponding RGB setting in Adobe Photoshop 5.0 or later is "Adobe Wide RGB."

The gamut of colors that can be expressed in the above color-space profiles is shown in the following chromaticity (x, y) graph. The greater the area enclosed by the triangle that represents the color-space profile, the wider its gamut.



## 2. Technical Data for RGB Profiles Supported in Nikon Capture 4

The following table shows the gamma values for profiles supported in Nikon Capture 4, together with the chromaticity values for the white point and for red, green, and blue.

| Profile | White point | | | Gamma value | Chromaticity (x, y) | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Color temperature | | Value | | Name | | R | G | B |
| Apple RGB | 6500 K ($D_{65}$) | x | 0.31271591 | 1.8 | Trinitron | x | 0.625 | 0.28 | 0.155 |
| | | y | 0.32900148 | | | y | 0.34 | 0.595 | 0.07 |
| Color Match RGB | 5000 K ($D_{50}$) | x | 0.34570292 | 1.8 | P22-EBU | x | 0.63 | 0.295 | 0.155 |
| | | y | 0.3585386 | | | y | 0.34 | 0.605 | 0.077 |
| sRGB | 6500 K ($D_{65}$) | x | 0.31271591 | 2.2 | HDTV (CCIR 709) | x | 0.64 | 0.3 | 0.15 |
| | | y | 0.32900148 | | | y | 0.33 | 0.6 | 0.06 |
| NTSC (1953) | Std Illuminant C | x | 0.3101 | 2.2 | NTSC (1953) | x | 0.67 | 0.21 | 0.14 |
| | | y | 0.3162 | | | y | 0.33 | 0.71 | 0.08 |
| Bruce RGB | 6500 K ($D_{65}$) | x | 0.31271591 | 2.2 | Bruce RGB | x | 0.64 | 0.28 | 0.15 |
| | | y | 0.32900148 | | | y | 0.33 | 0.65 | 0.06 |
| Adobe RGB (1998) | 6500 K ($D_{65}$) | x | 0.31271591 | 2.2 | Adobe RGB (1998) | x | 0.64 | 0.21 | 0.15 |
| | | y | 0.32900148 | | | y | 0.33 | 0.71 | 0.06 |
| CIE RGB | Std Illuminant C | x | 0.33333333 | 2.2 | CIE RGB | x | 0.735 | 0.274 | 0.167 |
| | | y | 0.33333333 | | | y | 0.265 | 0.717 | 0.009 |
| Adobe Wide RGB | 5000 K ($D_{50}$) | x | 0.34570292 | 2.2 | 700/525/ 450 nm | x | 0.735 | 0.115 | 0.157 |
| | | y | 0.3585386 | | | y | 0.265 | 0.826 | 0.018 |
| Default Windows monitor | 6500 K ($D_{65}$) | x | 0.31271591 | 2.2 | HDTV (CCIR 709) | x | 0.64 | 0.3 | 0.15 |
| | | y | 0.32900148 | | | y | 0.33 | 0.6 | 0.06 |
| Default Macintosh monitor | 5000 K ($D_{65}$) | x | 0.34570292 | 2.2 | Trinitron | x | 0.625 | 0.28 | 0.155 |
| | | y | 0.3585386 | | | y | 0.34 | 0.595 | 0.07 |

# Appendix B

*Color Matching in Adobe Photoshop (Version 7.0 or Later)*

When an image saved in Nikon Capture 4 is opened in Adobe Photoshop, the profiles used in Adobe Photoshop should match those used in Nikon Capture 4. If the profiles do not match, the colors seen in Adobe Photoshop may not be the same as those in the original image. The profiles used with Nikon Capture 4 can be used with Adobe Photoshop version 7.0 or later.

The first step is to match the Nikon Capture 4 monitor profile with that used in Adobe Photoshop (Windows only). The point to remember is that you should specify the monitor profile for Adobe Photoshop first and then select the same profile for Nikon Capture 4. For more information, see "Choosing a Monitor Profile". Macintosh users will not need to perform this step.

The next step is to save the image from Nikon Capture 4 using a format that supports inclusion of color profile information. If you save the image in TIFF, JPEG (JFIF), or JPEG (Exif), information about the color profile used in Nikon Capture 4 will be embedded in the file, and Adobe Photoshop will use this information to process colors appropriately when the file is opened. For more information, see "Adjusting Settings in Adobe Photoshop" (146).

## Step 1—Choosing a Monitor Profile

Choose a monitor profile as described below.

### Creating a New Monitor Profile

If you have not yet calibrated your monitor, use Adobe Gamma to create a profile for your monitor. Adobe Gamma is included in the standard install of Adobe Photoshop.

1 Start Adobe Gamma
Select **Adobe Gamma** from the system control panels or double-click the **Adobe Gamma** utility icon.

**ColorSync (Macintosh)**

The explanation in this section assumes that ColorSync version 3.0 or later is installed on your Macintosh.

**2 Create a color profile**
Follow the on-screen directions to calibrate your monitor. The resulting monitor profile will be saved in the folder listed below. Make a note of the file name.

- Windows XP/Windows 2000
  Windows/system32/spool/drivers/color
- Windows Me/Windows 98 SE
  Windows/System/Color

**3 Choose the profile created in Step 2 for Nikon Capture 4**
Choose the profile created in Step 2 as the Nikon Capture 4 monitor profile. For details, see "Nikon Capture 4 Editor Preferences: The Color Management Tab" (98).

**Using an Existing Monitor Profile**

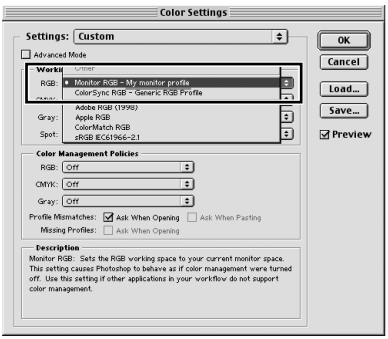
If you have already calibrated your monitor, follow the steps below to select an existing monitor profile.

## 1 Display the Color Settings dialog

Select **Color Settings...** from the Adobe Photoshop **Edit** menu.

## 2 Note the name of the monitor profile

Open the **RGB** pop-up menu in the **Work Spaces** section of the **Color Settings** dialog. The monitor profile will appear to the right of the **Monitor RGB** entry. Note down the name of the profile.


Color Settings
Settings: Custom
Advanced Mode
RGB: Monitor RGB - My monitor profile
ColorSync RGB - Generic RGB Profile
Gray:
Spot:
Adobe RGB (1998)
Apple RGB
ColorMatch RGB
sRGB IEC61966-2.1
OK
Cancel
Load...
Save...
Preview
Color Management Policies
RGB: Off
CMYK: Off
Gray: Off
Profile Mismatches: Ask When Opening Ask When Pasting
Missing Profiles: Ask When Opening
Description
Monitor RGB: Sets the RGB working space to your current monitor space. This setting causes Photoshop to behave as if color management were turned off. Use this setting if other applications in your workflow do not support color management.

## 3 Locate the monitor profile

The monitor profile that appeared in Step 2 will be stored in the folder listed below.

- Windows\System\Color

## 4 Choose the profile as the Nikon Capture 4 monitor profile

Choose the profile noted in Step 2 as the Nikon Capture 4 monitor profile. For details, see "Nikon Capture 4 Editor Preferences: The Color Management Tab" (98, 99).

If you are unable to locate a profile with the correct name, create a new profile as directed in "Creating a New Monitor Profile" (143).

## Step 2—Adjusting Settings in Adobe Photoshop

The following describes the minimum necessary adjustments to ensure consistent color reproduction in Adobe Photoshop 7.0. The menus and dialogs referred to below are all from Adobe Photoshop.

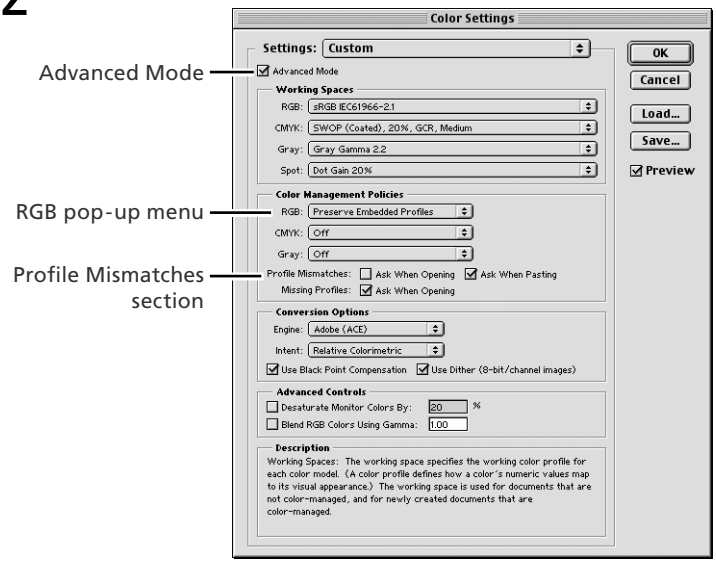
**Opening TIFF and JPEG Images Created Using Nikon Capture 4**

Images saved in TIFF, JPEG (JFIF), and JPEG (Exif) formats include color-space profile information. Open files in these formats as described below.

1 Display the Color Settings dialog

Select **Color Settings...** from the Adobe Photoshop **Edit** menu.

2 Check Advanced Mode


Advanced Mode
RGB pop-up menu
Profile Mismatches section
Color Settings
Settings: Custom
OK
Cancel
Load...
Save...
Preview
Advanced Mode
Working Spaces
RGB: sRGB IEC61966-2.1
CMYK: SWOP (Coated), 20%, GCR, Medium
Gray: Gray Gamma 2.2
Spot: Dot Gain 20%
Color Management Policies
RGB: Preserve Embedded Profiles
CMYK: Off
Gray: Off
Profile Mismatches: Ask When Opening Ask When Pasting
Missing Profiles: Ask When Opening
Conversion Options
Engine: Adobe (ACE)
Intent: Relative Colorimetric
Use Black Point Compensation Use Dither (8-bit/channel images)
Advanced Controls
Desaturate Monitor Colors By: 20 %
Blend RGB Colors Using Gamma: 1.00
Description
Working Spaces: The working space specifies the working color profile for each color model. (A color profile defines how a color's numeric values map to its visual appearance.) The working space is used for documents that are not color-managed, and for newly created documents that are color-managed.

**3** Select **Preserve Embedded Profiles** for Color Management Policies
Select **Preserve Embedded Profiles** from the **RGB** pop-up menu in the Color Management Policies section.

**4** Remove the check from **Ask When Opening**
Remove the check from **Ask When Opening** in the Profile Mismatches area of the Color Management Policies section.

**5** Close the Color Settings dialog
Click **OK** to close the Color Settings dialog.

At these settings, a warning may be displayed when an image is opened. To prevent the warning being displayed again, select the appropriate option in the warning dialog.

**Nikon Capture 4 and Adobe Photoshop Color Profiles**

| Nikon Capture 4 output profile | Adobe Photoshop profile |
|---|---|
| sRGB<br>(Nikon sRGB 4.0.0.3000) | sRGB |
| Apple RGB<br>(Nikon Apple RGB 4.0.0.3000) | Apple RGB |
| Color Match RGB<br>(Nikon Color Match RGB 4.0.0.3000) | Color Match RGB |
| Bruce RGB<br>(Nikon Bruce RGB 4.0.0.3000) | — |
| NTSC (1953)<br>(Nikon NTSC (1953) 4.0.0.3000) | NTSC (1953) |
| Adobe RGB (1998)<br>(Nikon Adobe RGB (1998) 4.0.0.3000) | Version 5.5 or later: Adobe RGB (1998)<br>Earlier versions: SMPTE-240M |
| CIE RGB<br>(Nikon CIE RGB 4.0.0.3000) | CIE RGB |
| Adobe Wide RGB<br>(Nikon Adobe Wide RGB 4.0.0.3000) | Version 5.5 or later: Adobe Wide RGB<br>Earlier versions: Wide Gamut RGB |

# Appendix C

*Troubleshooting*

Should you encounter problems with Nikon Capture 4, check the list on the following pages before consulting your retailer or Nikon representative.

**Nikon Capture 4 Does Not Start**

Confirm that your computer system meets all of the requirements specified for using Nikon Capture 4 (OS, memory, hard disk capacity, etc.). See "System Requirements" (4).

**Nikon Capture 4 Does Not Recognize the Camera**

Verify that Nikon Capture 4 has recognized the camera. D1-series, D2H, D100, and D70 cameras will display **PC** in the control panel on top of the camera.

1 Check the power switch and mode dial

- Is the camera on?
- Is the battery fully charged? To reduce the drain on the battery, we recommend that the camera be powered by an adapter (available separately) when connected to the computer.
- If you are using an AC adapter, is it properly connected and plugged in?
- Is the mode dial set to **PC** (D1-series only)?
- Is the function dial set to **P**, **S**, **A**, or **M** (D100 only)?
- Is the correct option selected in the **USB** menu (D2H, D100, and D70 only)? Select **PTP** when connecting the D2H or D70 to a computer running Nikon Capture 4 Camera Control. Select **Mass Storage** when connecting the D100 to a computer running Windows 2000 Professional, Windows Millennium Edition (Me), or Windows 98 Second Edition (SE). When connecting the D100 to a Macintosh computer, select **PTP**.

2 Verify that the interface cable is properly connected

- Is the interface cable securely connected to both camera and computer?
  Remember that IEEE 1394 connectors do not make a "click" when fully inserted. If the cable is securely connected, try disconnecting the cable and reconnecting the devices in a different order.
- Is there another peripheral connected to the IEEE 1394 bus?
  Try disconnecting other IEEE 1394 devices and connecting just the computer and the camera.

3 Are you using a recommended IEEE 1394 interface (D1-series cameras only)?

See "System Requirements" (4). For information on your IEEE 1394 interface, see the manufacturer's web-site.

**The ReadMe File**

Included on the installer CD is a README file containing the most current information on Nikon Capture 4. Please read this file before installing and using Nikon Capture, as it may contain important information that could not be included in this manual. Should you encounter problems with Nikon Capture 4 not covered in this section, please consult the README file for the most up-to-date information.

**4 Is the IEEE 1394 interface board correctly registered with the system (Windows only)?**

Check whether:

- The "IEEE 1394 Bus Controller" is not displayed in the Device Manager
- The IEEE 1394 board is listed under "Other Devices" or "Unknown Devices"
- A yellow or red mark appears next to the listing for the IEEE 1394 board

If any of the above apply, the IEEE 1394 board has not been correctly registered with the system. See the documentation provided with the board for information on device registration.

**Nikon Transfer Does Not Start**

If Nikon Transfer fails to start when a supported camera is connected or a memory card from a supported camera inserted in a card reader or PC card slot, check that the memory card is properly inserted in the camera, card reader, or card slot, that the interface cables are properly connected, and the camera is turned on. Note that Nikon Transfer will not start automatically when **Disable auto launch** is selected in the Auto Launch tab of the Nikon Browser or Nikon Viewer Preferences dialog. Nikon Transfer will not start when Nikon Capture 4 Camera Control is running.

**Captured Images are Too Bright, Too Dark, Washed Out, or Out of Focus**

- At default settings, Nikon Capture 4 does not modify images when they are captured from the camera. In the General tab of the Preferences dialog, verify that your images are being captured at Nikon Capture's default settings and not at the settings of the last image captured. See "Preferences" for more information (94). Alternatively, check the settings in the Curves, Color Balance, and Unsharp Mask windows. Choose the reset option from the Settings menu for each window, or turn the Apply button for the window off.
- Are monitor settings correctly adjusted?
  Try adjusting your monitor's contrast/brightness, color system, etc. to be sure that it is properly set for viewing images. See the documentation provided with your monitor for instructions on adjusting monitor settings.

# Appendix D

*Glossary*

This glossary provides definitions of some of the terms used in this manual.

### Bit depth

The number of bits used to express color, also referred to as color depth. The bit depth determines the amount of color information in an image. The greater the bit depth, the larger the number of colors, and the finer the gradations, that can be expressed. Bit depth can be used to refer both to the number of bits per channel and to the combined bit depth for all channels; thus, for example, an image with a bit depth of eight bits per channel can be said to have a bit depth of twenty-four bits. An image with a bit depth of one bit has only two colors, typically black and white, with no gradation between the two. *See also* **Channel**.

### Black Point

The input value below which all input tones are mapped to the minimum output value (by default no color, or black). Any details darker than the black point will be lost. *See also* **Tone, Tone curve.**

### Channel

The component colors in a given color space. The RGB color space is made up of red, green, and blue channels and a master channel that combines the three. *See also* **Color space.**

### Clip

The percentage of pixels at both ends of the curve that are excluded in an auto contrast operation. *See also* **Tone curve.**

### CMS

*See* **Color management system.**

### CMYK

A reflective (subtractive) color model commonly used in printing, which models color using combinations of the three secondary colors used in printer's ink, **C**yan, **M**agenta and **Y**ellow. Because no combination of these three inks will create a true black, blac**K** ink is also used.

### Color management system

A method of ensuring consistency of color reproduction between devices such as scanners, monitors, and printers, and between different computer platforms. In the color management system used in Nikon Capture 4, accurate color reproduction is ensured through the use of profiles that provide information about the characteristics of the monitor or printer and the color space used for editing. *See also* **ColorSync, ICC, Profile.**

### Color space

A general term encompassing both the model used to define color (for example, CMYK or RGB) and the range, or gamut, of colors that can be expressed in a given color model. *See also* **CMYK, Gamut, RGB.**

### ColorSync

A color management system for Mac OS developed by Apple. *See also* **Color management system**, **ICC**.

### CompactFlash™ memory card
A small, removable flash memory card. Used for storage of photographs in Nikon digital cameras.

### Compression
A method for reducing file sizes for storage or transmission. Compression algorithms can be divided into "lossless" algorithms, such as LZW, in which no information is lost when files are restored to their original size for display or editing, and "lossy" algorithms, such as JPEG, in which some information is lost when the file is restored. *See also* **JPEG, TIFF.**

### Crop
The portion of the image selected in an image window.

### Curve
*See* **Tone Curve.**

### Eyedropper
A tool for sampling white point, black point, or midpoint. *See also* **Black point, Midpoint, White point.**

### FireWire
Apple's term for the IEEE 1394 interface. *See* **IEEE 1394.**

### Fisheye lens
A "fisheye" lens is any lens with a view angle of 180 degrees or more. Fisheye lenses may have a view angle of 180 degrees in all directions or only diagonally. Distortion increases towards the edges of the picture, with little or no distortion at the center of the image. The Fisheye Lens palette in Nikon Capture 4 can be used to reduce distortion in images taken with an AF DX Nikkor ED 10.5 mm f/2.8G lens to create an image close to what would be produced by an ordinary wide-angle lens.

### Gamma
Gamma (also written "γ"), a fundamental property of video systems, determines the intensity of the output signal relative to the input. When calculating gamma, the maximum possible input intensity is assigned a value of one, and the minimum possible intensity (no input) is assigned a value of zero. Output is calculated by raising input to the inverse of the gamma value ($output = input^{(1/\gamma)}$).

### Gamut
The range of colors that can be expressed by a given input device (for example, scanner or digital camera), output device (monitor or printer), or color profile. No gamut can reproduce all of the colors seen by the human eye. The gamut of primary RGB (**R**ed, **G**reen, and **B**lue) transmitted light displays (film transparencies and color monitors) is very different from, and complementary to, the gamut of secondary CMYK (**C**yan, **M**agenta, **Y**ellow, and blac**K**) reflected light displays (printed materials). *See also* **CMYK, Profile, RGB.**

### Gray point
*See* **Midpoint.**

### Halo width

The extent of pixels around a selected central pixel affected when Unsharp Mask is applied. Also referred to as "radius." Increasing the halo width increases the width of edges affected by Unsharp Mask. Excessive application of Unsharp Mask results in an undesirable halo along edges in the image. *See also* **Unsharp Mask.**

### Histogram

A bar graph showing the distribution of tones in an image. The horizontal axis shows tone level (brightness), the vertical axis the number of pixels. The bars in the graph show the number of pixels of a given brightness in the image. The histogram displayed in the Curves window shows the distribution of tones for the currently selected channel, and can be used for reference when editing curves. *See also* **Tone, Tone curve.**

### ICC

The **I**nternational **C**olor **C**onsortium, an international organization working to develop standards for color management and color management profiles. ICC profiles were developed for the conversion of color space information between devices, and are now on their way to becoming a global standard. ICC profiles have been proposed as an International Organization for Standardization (ISO) standard. *See also* **Profile.**

### IEEE 1394

A high-speed transfer protocol developed by the **I**nstitute of **E**lectrical and **E**lectronics **E**ngineers for connecting peripherals such as hard disks, MO drives, and digital cameras to a computer via a cable.

### JPEG

A standard graphic format designed by the **J**oint **P**hotographic **E**xperts **G**roup. Images are compressed using a discrete cosine transform that takes advantage of the properties of human vision, which is more sensitive to light in the lower wavelengths, to increase quantization at lower frequencies. JPEG compression is "lossy," meaning that information is lost when images are compressed, leading to a drop in image quality. A lossless compression option is also supported in some implementations. JPEG images can be compressed to as much as 100:1, though quality will be significantly reduced. At a compression ratio of 20:1, image quality is not noticeably diminished.

### LCD

**L**iquid **C**rystal **D**isplay. LCDs are notable for their thinness, lightness, and the fact that they consume relatively little energy.

### Midpoint

Controls the output level for mid-tones in the original image. *See also* **Tone, Tone curve.**

### NEF

An abbreviation of Nikon Electronic Image Format, an image file format developed by Nikon to support high-resolution, twelve-bit RAW image data. In Windows, NEF files have the extension ".nef". NEF images can be opened and edited only in Nikon Capture. The advantage of NEF is that while user settings such as curves and color balance are saved, they are not applied to the original image data. NEF images may thus be edited and saved several times without degrading or altering the original image. NEF files however require a relatively large amount of storage space. *See also* **RAW image.**

**Noise**
Data in an image file that are not a part of the original image, the digital equivalent of film grain. The presence of noise is reflected in a loss in image quality. Noise appears primarily in dark areas of the image, and can be reduced by adjusting exposure or lighting to fill in shadows.

**ppcm**
**p**ixels **p**er **c**enti**m**eter, a measure of resolution. The more pixels per centimeter, the higher the resolution. *See also* **ppi, Resolution.**

**ppi**
**p**ixels **p**er **i**nch, a measure of resolution. The more pixels per inch, the higher the resolution. *See also* **ppcm, Resolution.**

**Preferences**
Settings controlling basic operations performed by a given program, adjustable by the user.

**Profile**
A file defining the color characteristics of an input device such as a scanner or digital camera, an output device such as a printer or monitor, or the color space used for editing images. Profiles are used by color management systems to ensure consistent color reproduction. The Nikon Color Management System used in Nikon Capture employs ICC profiles. *See also* **Color space, ICC.**

**RAW image**
A photograph taken at an image quality setting of HI-RAW. "Raw," unmodified image data from the camera's image sensor (charge-coupled display, or CCD) are saved in uncompressed form at a pixel bit-depth of twelve bits per pixel. RAW images can only be opened in Nikon Capture 4, and must be saved again in a standard image format such as TIFF or JPEG before they can be opened in another application. *See also* **NEF.**

**Resolution**
The density of dots or pixels that make up an image, measured in dots per inch (dpi) or pixels per inch (ppi); the resolution of Macintosh monitors, for example, is 72 ppi. The greater the density of dots or pixels, the higher the resolution and the greater the capacity to express detail. Resolution is hence the digital equivalent of film resolving power. Computer monitors typically have a resolution of 72 ppi or 96 ppi, while printers may have resolutions of 300 dpi, 600 dpi, 1200 dpi, or 2400 dpi. *See also* **ppcm, ppi.**

**RGB**
An additive color model commonly used in monitors, in which light emitted in three primary colors, **R**ed, **G**reen and **B**lue, is combined to create a wide variety of colors. White is modeled by mixing 100% of all three colors.

**Scale**
The output size of an image as a percentage of the input size. At a scale of 50%, images will be output at half their original size.

**Speedlight**
A brand name for Nikon flashes.

### Threshold
The limit up to which Unsharp Mask will be applied. While it is generally the case that the higher the threshold, the greater the amount of sharpening applied, the exact effect depends on other Unsharp Mask settings, such as halo width. *See also* **Halo width, Unsharp Mask.**

### Thumbnail
A small preview image, the digital equivalent of a photographic film contact sheet. Images loaded into Nikon Capture are displayed in a thumbnail list in the Thumbnails section of the Camera Image window.

### TIFF
**T**agged **I**mage **F**ile **F**ormat, an image file format for color or grayscale images, suited to storing bit-mapped images such as digital photographs. In some implementations, TIFF supports "lossless" LZW and packbit compression (in "lossless" compression methods, no information is lost when the image is compressed, as opposed to "lossy" compression methods such as JPEG, in which detail is sacrificed to achieve higher compression ratios). Images saved in TIFF format using Nikon Capture are not compressed. *See also* **Compression, JPEG.**

### Tone
Pixel brightness, measured either as the combined intensity for red, green, and blue or the intensity of each of these colors (channels) individually. The number of tones that can be expressed depends on the bit depth of the image; Nikon Capture 4 supports 256 tone levels per channel at a bit depth of eight bits and 4096 tone levels per channel at a bit depth of twelve bits (data with a bit depth of twelve bits are handled internally as sixteen-bit data). The distribution of tones in the image can be seen in the Curves window histogram. *See also* **Bit depth.**

### Tone curve
A visual tool for editing tones, enhancing brightness and contrast in a selected portion of the tone range. Changing the shape of the tone curve changes the mapping between input (the tones in the original image) and output (tones as they appear after editing). The digital equivalent of a densitometric curve. *See also* **Tone.**

### Unsharp Mask
A filter for increasing the apparent sharpness of bit-mapped images. Sometimes abbreviated as "USM." Unsharp masks emphasize the differences in color and brightness between edges (outlines) and the rest of the image. *See also* **Halo width, Threshold.**

### USB
Universal Serial Bus. A standard for computer serial interfaces which allows automatic "plug-and-play" recognition of peripheral devices and "hot plug" connection of peripherals while the computer or device is on. Depending on the type of interface installed on the computer, USB will operate at high speed (USB 2.0 only), with data transfer rates of up to 480 Mbps, or full speed (USB 1.1, USB 2.0), with data transfer rates of up to 12 Mbps. For more information, consult the manufacturer.

### White balance

The human eye is able to adapt to changes in lighting, and consequently to humans a white object will still look white whether viewed in direct sunlight or under overcast skies, or indoors under incandescent or fluorescent lighting. A digital camera, in contrast, must adjust colors according to lighting if colors that appear white when viewed directly are also to appear white in the final photograph. This adjustment is called "white balance."

### White point

The input value above which all input tones are mapped to the maximum output value (the default for the master channel is white). Any details brighter than the white point will be lost. *See also* **Tone, Tone curve.**

# Index


**A**
AC adapter, 127, 136
Adobe Photoshop, 94–95, 140–141, 143–147
Adobe RGB, 141, 147
AdobeWide RGB, 141, 147
Advanced Color tab, 96–97
Advanced RAW palette, 27, 28, 35–37
Apple RGB, 140, 147
Apply button, 25
Auto contrast, 44, 47, 55, 96
Auto–contrast clip, 96, 150

**B**
Batch processing, 88–92. *See also* Live Batch
Bird's Eye palette, 19
Bit depth, 82, 92, 114, 150
Black point, 44, 47–50, 96–97
Bracketing, 117, 126
Brightness, 21, 55, 61–62
Bruce RGB, 140, 147

**C**
Camera control, 101–137
Camera menu, 129–131
Channel, 44–47, 49, 52, 54–57
Chroma, 54, 56, 59
CIE RGB, 141, 147
CMYK, 98–100
  default, 98, 99
  profile, 98–100
Color, 21, 36, 44–52, 54–57, 59, 61–62, 96–97, 98–100
Color Balance palette, 27, 28 61–63
Color Booster palette, 27, 28, 59–60
Color management, 98–100
ColorMatch RGB, 140, 147
Color Moire Reduction, 67
Color saturation, 36
Color space, 150
  profile, 98–100, 140–141
ColorSync, 99
Color temperature, 29–30, 130
CompactFlash card. *See* memory card
Compression, 79, 124
Connecting a camera, 104
Contrast, 61
Contrast slider, 61–62
Crop, 24, 151
  selection, 24
Crop cursor, 24
Curves palette, 27, 28, 44–53
Custom settings, 132–134

**D**
Digital DEE palette, 27, 69–72
Display profile, 98–100

**E**
Editing, 7–100
Eyedropper tool, 31, 44, 49, 52, 97, 151
Exposure compensation, 35, 121

**F**
File formats, 13, 79
File names, 82, 91, 109, 114
FireWire, 4, 151
Fisheye Lens , 27, 73–74, 151
Fisheye Lens palette, 27, 73–74
Flash sync mode, 122
Flexible program, 121
Flipping images, 20

**G**
Gamma, 51, 151
Gamut, 141, 151
General tab
  Nikon Capture 4 Camera Control, 136
  Nikon Capture 4 Editor, 94–95
Gray point, 31–32, 55. *See also* midpoint
  setting, 31–32
Grid lines, 97

**H**
Halo width, 65, 152
Hand Cursor, 18
Highlights, 23, 45
Histogram, 44, 46, 55, 111, 129, 152
Hue, 36, 57, 128

**I**
ICC, 99, 152
IEEE 1394, 4, 152
Image Dust Off, 27, 38–41, 130
Image Dust Off palette, 27, 38–41
Indicator, 26
Information palette, 21–22
Installation, 5
Intensity, 42–43, 56, 65
ISO equivalency. *See* sensitivity

**J**
JPEG, 13, 20, 79, 152

**L**
LCD, 152
  Simulated LCD panel, 119–120
LCH Editor palette, 27, 28, 54–58
Live Batch, 112–115
Luminosity, 55

**M**
Master curve, 44–52
Memory card, 32–33
Metering, 120, 122
Midpoint, 51–52, 152
Mired, 29
Multi-Image Window, 15–17, 82

**N**
NEF, 13, 79, 152
Nikon View, 3
Noise reduction, 27, 67–68, 128
Noise Reduction palette, 27, 67–68
Nikon Capture 4 Camera Control, 101–137
Nikon Capture 4 Editor, 7–100
NTSC (1953), 140, 147

**O**
Open, 13–17
Original image, 9
Output size, 75–77

**P**
Photo information, 8
PictureProject, 3
Pixel, color of, 21
Preferences
  Nikon Capture 4 Camera Control, 135–137
  Nikon Capture 4 Editor, 93–100
Printer profile, 98, 100
Printer resolution, 153
Printing images, 84–87
Profiles, 98–100, 140–147, 153

**R**
RAW, 13, 27, 28, 124, 153. *See also* NEF
Resolution, 75–77, 153
RGB, 153
  color–space profile, 98–100, 140–141
  default RGB profile, 98, 99
Rotating images, 20

**S**
Save Progress Window, 83, 95
Saving images, 80–83
Scale, 75–76, 153
Sensitivity, 40, 122
Settings, saving and loading, 34, 37, 41, 43, 53, 58, 60, 63, 66, 68, 72, 74, 77, 78
Size/Resolution palette, 27, 75–77
Shadows, 23, 45
Sharpening, 35, 128. *See also* unsharp mask
Shoot button, 119–120
Shooting data. *See* photo information
sRGB, 36, 98, 140, 147
Subdivisions, 97
System requirements, 4

**T**
Temporary files, 96, 137
Threshold, 64–65, 70–71, 154
Thumbnail, 15–17, 154
TIFF, 13, 27, 79, 82, 95, 154
Time lapse photography, 116–118
Title bar, 8
Tone compensation, 35–36, 128
Tool palettes, 8, 25 –28

**U**
Unsharp mask, 27, 64–66, 154
Unsharp Mask palette, 27, 64–66
USB, 4, 154

**V**
Vignette control, 27, 42–43

**W**
White balance, 27, 28, 29–34, 123, 130
  fine–tuning, 30, 130
White Balance palette, 27, 28, 29–34
White point, 44, 47–50, 96–97

**X**
x–y coordinates, 21

**Z**
Zoom, 18
Zoom ratio, 18

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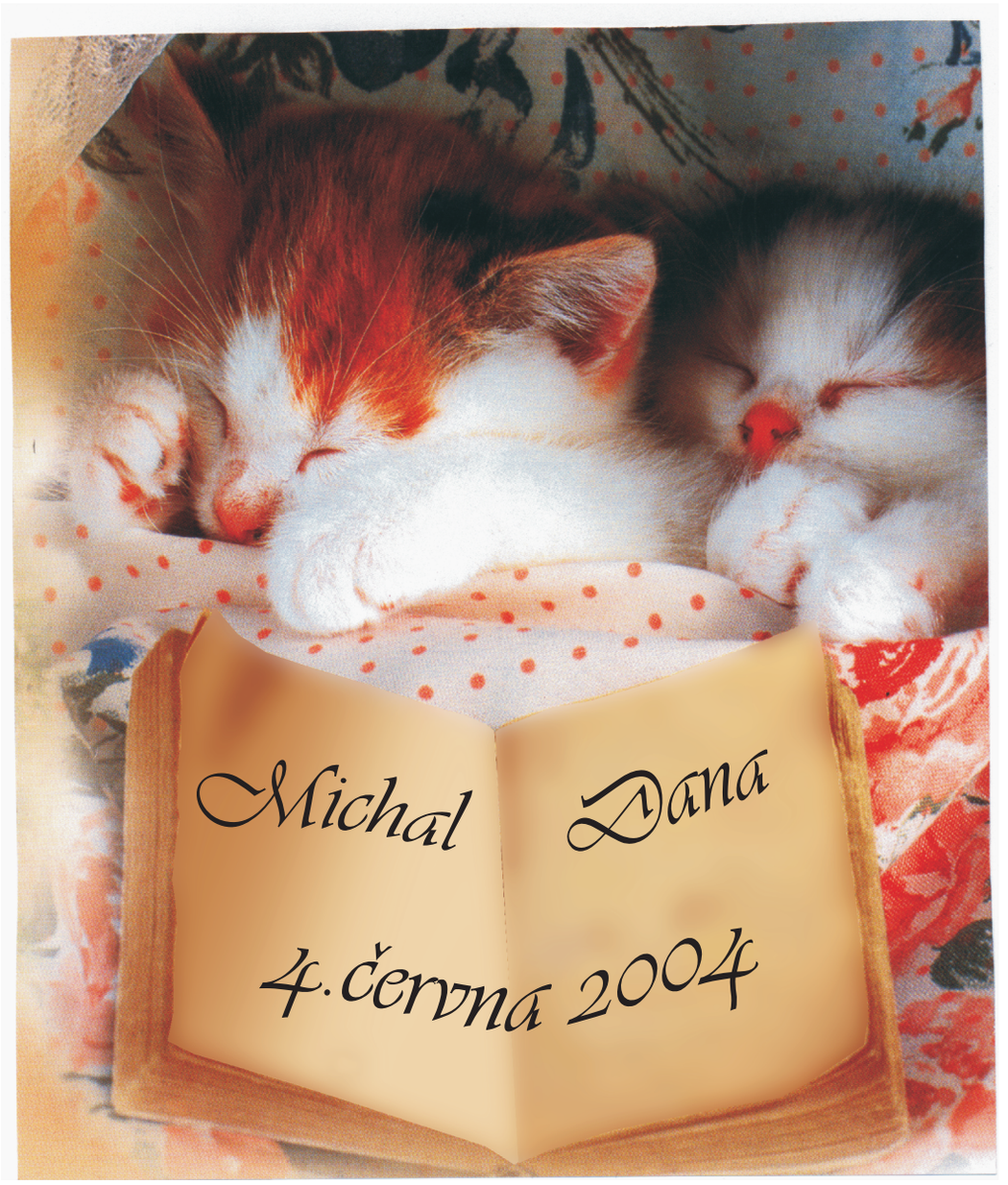
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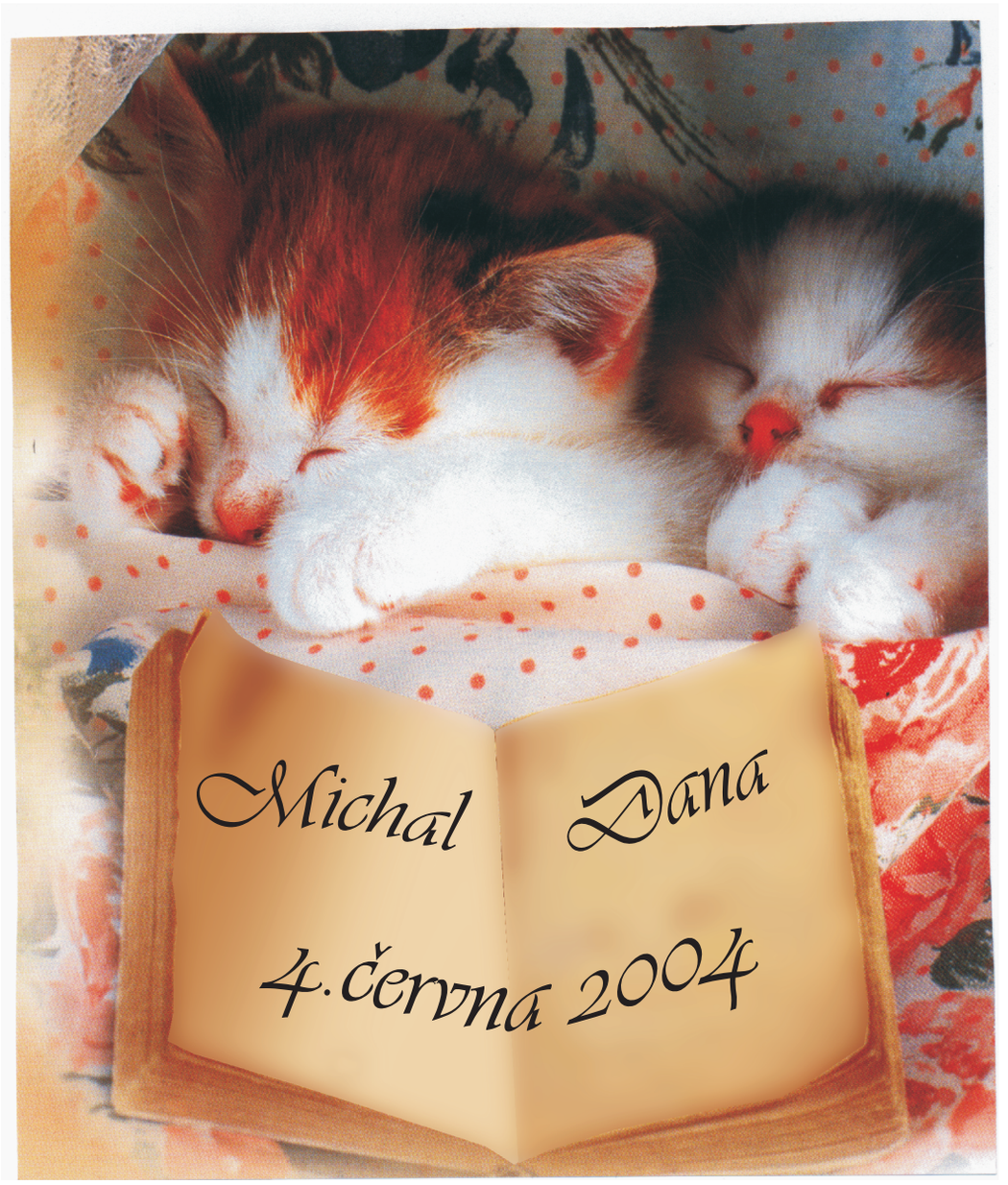
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